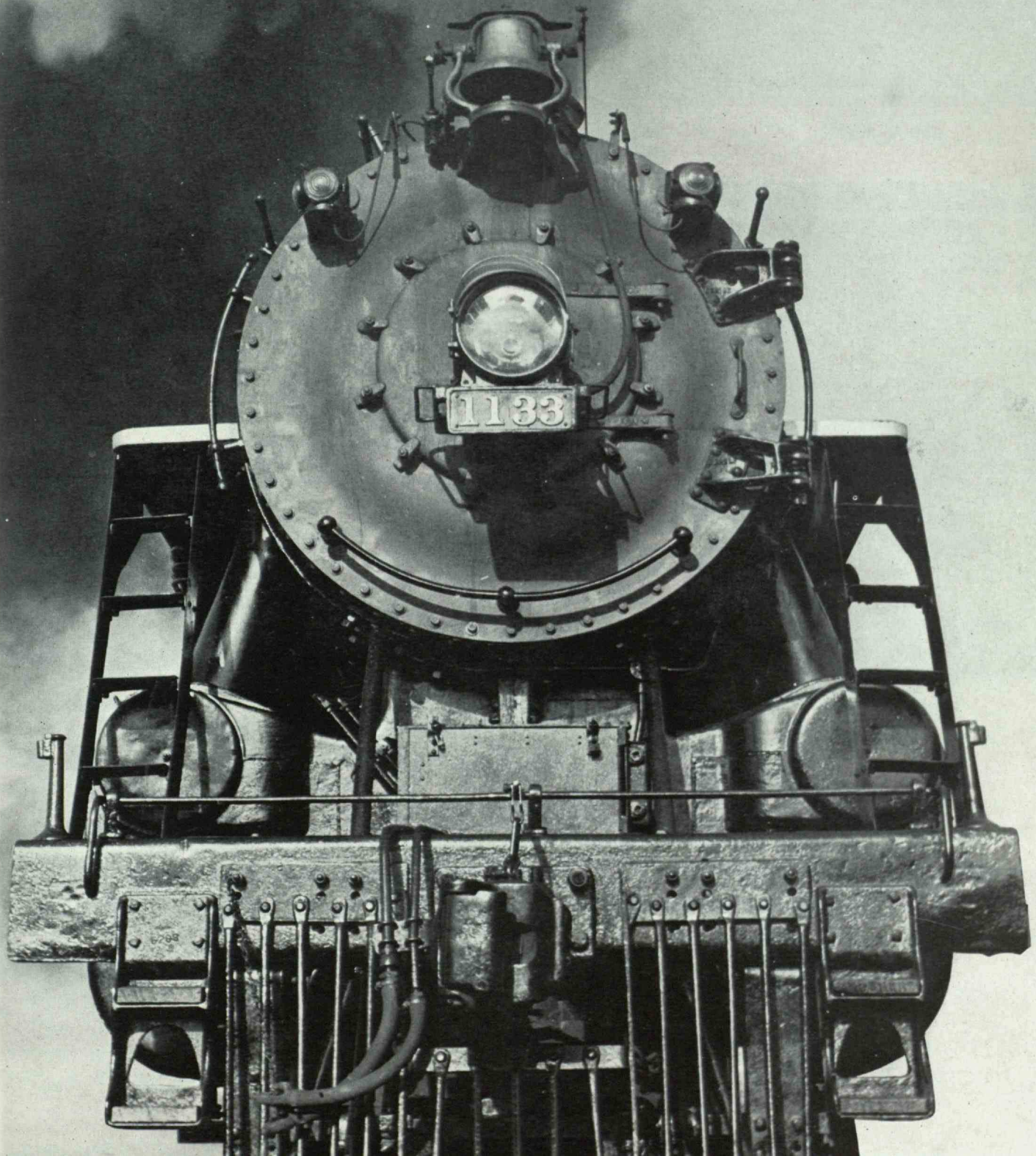


TECHNOLOGY

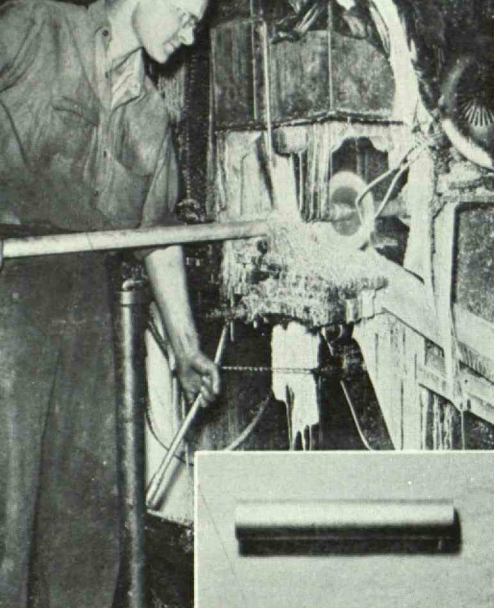
REVIEW *April* 1949



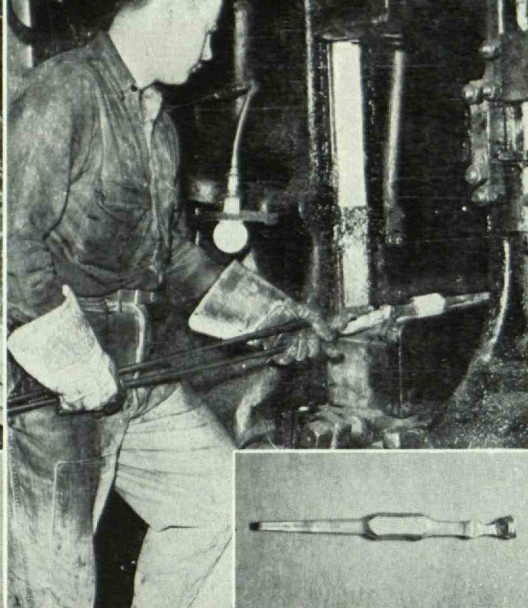
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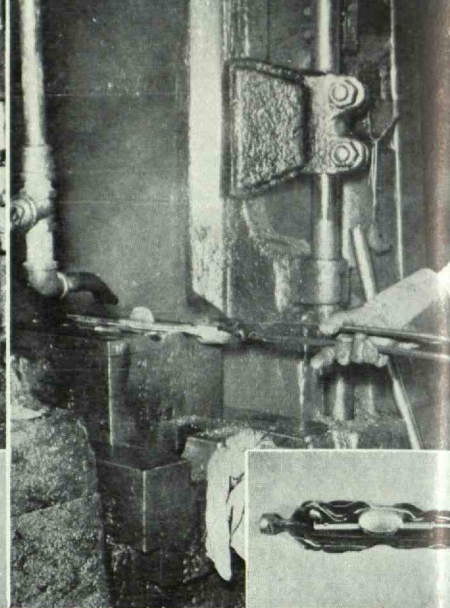
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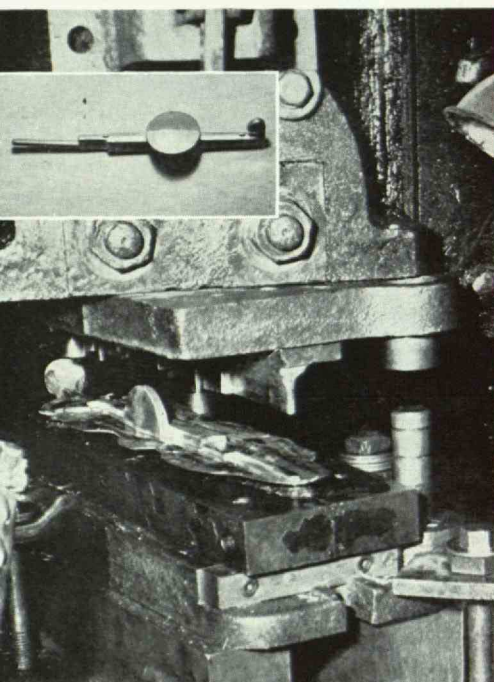
Cutting Bar



Lengthening and Shaping



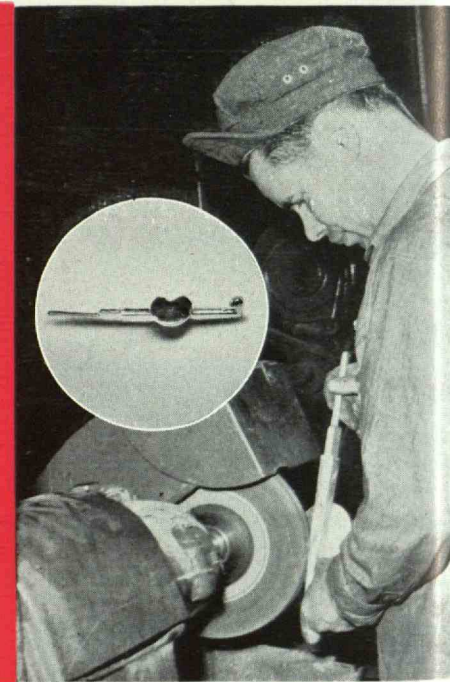
Shaping to the Die



Trimming the Flash

FORGING ALUMINUM

into
Pressure Cooker Tops



Finishing and Polishing

The Harvey Metal Corporation

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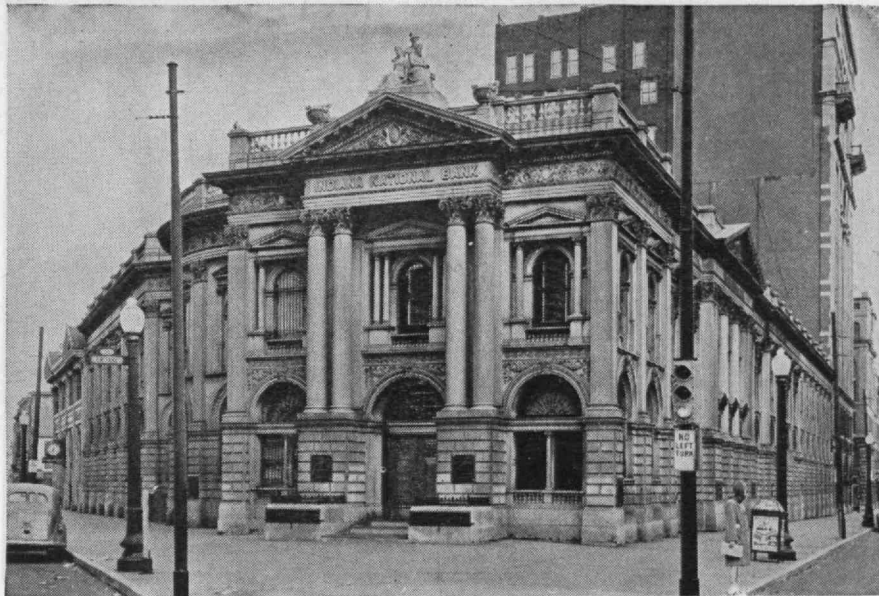
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East Side, West Side, All Around Indianapolis



Main Office of Indiana National Bank, Indianapolis. Equipped when originally designed by D. A. Bohlen & Son with Webster Steam Heating System. In 1947, Strong Brothers, heating contractors, modernized the installation by installing Webster Moderator System.

The Indiana National Bank, successor in 1865 to the business of the Indianapolis branch of the State Bank of Indiana, organized in 1834, has been a Webster customer for over 34 years.

Ever since a Webster Vacuum System was installed in the main office building in 1914, Webster Equipment has been purchased for the main office building and the various branches, keeping the bank properties abreast of the latest developments in comfort and economy in heating.

In 1947, a Webster "Controlled-by-the-Weather" Moderator System with Outdoor Thermostat was installed in the main office building. Prefabricated Webster System Convec-

tor Radiation with integral supply valve and thermostatic trap was used.

Webster Systems of Steam Heating are also installed in the three recently constructed branch office buildings of the Indiana National Bank.

In each of the new branch offices, Webster Type WI Extended Surface Radiation with Webster traps and valves was installed. Especially suitable for this type of building which has limited floor space, WI Radiation meant increased useable aisle space.

As was the case in their selection of heating equipment, Indiana National Bank chose the same architectural firm to design all of their buildings.



East Side Branch Office, Indiana National Bank, Indianapolis. Equipped with Webster Heating System. Heating Contractor: Cook Brothers.



West Side Branch Office, Indiana National Bank, Indianapolis. Equipped with Webster Heating System. Heating Contractor: Roland M. Cotton Co., Inc. Consulting Engineer: Ammerman, Davis & Stout.



North Side Branch Office, Indiana National Bank, Indianapolis. Equipped with Webster Heating System. Heating Contractor: Roland M. Cotton Co., Inc.

D. A. Bohlen & Son is said to be the oldest established firm of architects in the United States, servicing Indianapolis clients for the past 80 years.

An important factor in the success of these installations was the close association that has existed between bank management, under President Russell L. White, the Architect and Webster Representative, S. E. Fenstermaker.

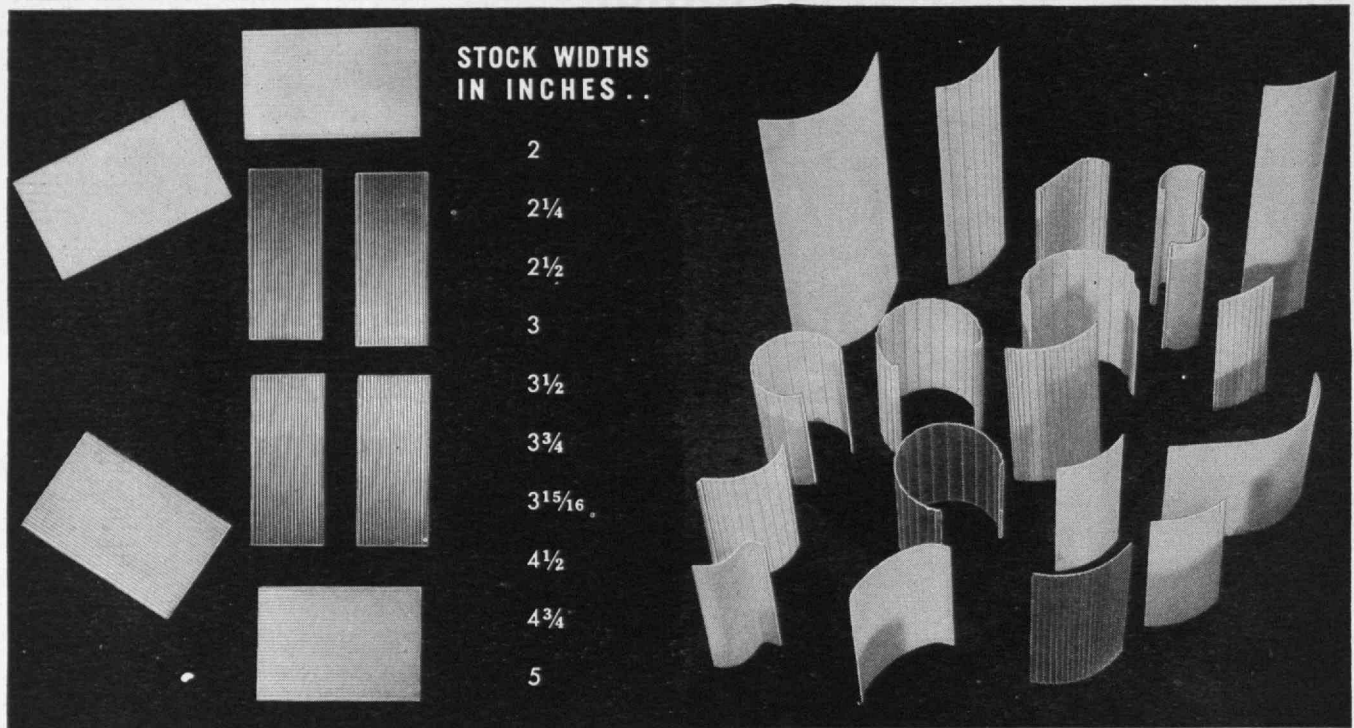
The story of Webster heating in Indiana National Bank illustrates how Webster serves their customers. Let us help you with your heating.

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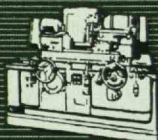
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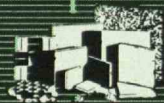
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NORBIDE



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LABELING MACHINES



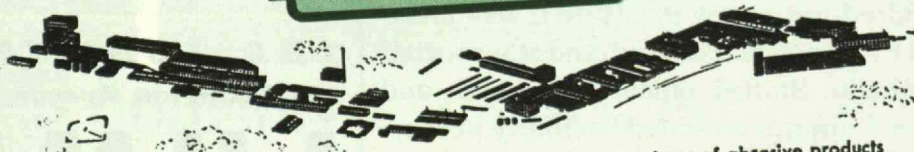
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AND CLOTH...
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Another NORTON "FIRST"

THIS time it's a ceramic surface plate—an entirely new type of plate for toolmakers and inspectors to use in making their precise measurements. This Norton-developed ceramic plate has distinct advantages over previous types of surface plates including: (1) a longer-lived surface, (2) a smoother surface, (3) a flatter surface and one that stays flat. It's a plate that will not warp or deform, will not sweat or corrode, will not deflect under load.

The development of this unique surface plate is typical of the progressive research that has made Norton an acknowledged leader—not only in abrasives and grinding wheels but also in the development of grinding and lapping machines, high temperature refractories and a wide variety of wear-resistant materials.



The main Worchester plant of Norton Company—world's largest producer of abrasive products

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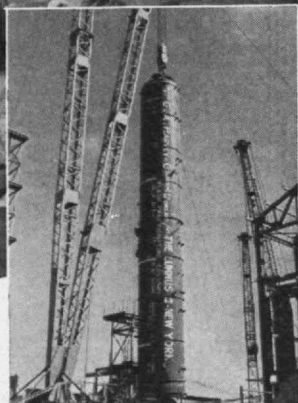


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for Shell's
Cardon Refinery
Venezuela

... now being built by Lummus



A Shell Photograph

A Shell Photograph

Typical of the scope of Lummus foreign operations is the construction of a refinery at Cardon, Venezuela, by The Lummus Company of New York and Compania Anonima Venezolana Lummus for The Shell Oil Company of Venezuela. Most of the fractionating equipment, like the hundred-ton tower illustrated, was fabricated in England and Holland, and transported to Venezuela. Staffed offices in London and Paris give Lummus an added flexibility in operation and the advantages of wide purchasing contracts.

In oil producing states in America, all through Europe, in the Near East, Netherlands

Indies, South America, China—Lummus has built more than 150 gasoline refineries, upwards of 90 process units for solvent refining and dewaxing of lube oils and more than 300 chemical units, including complete plants of ethylene, butadiene, styrene, phenol.

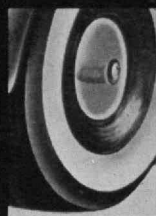
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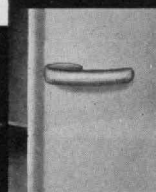
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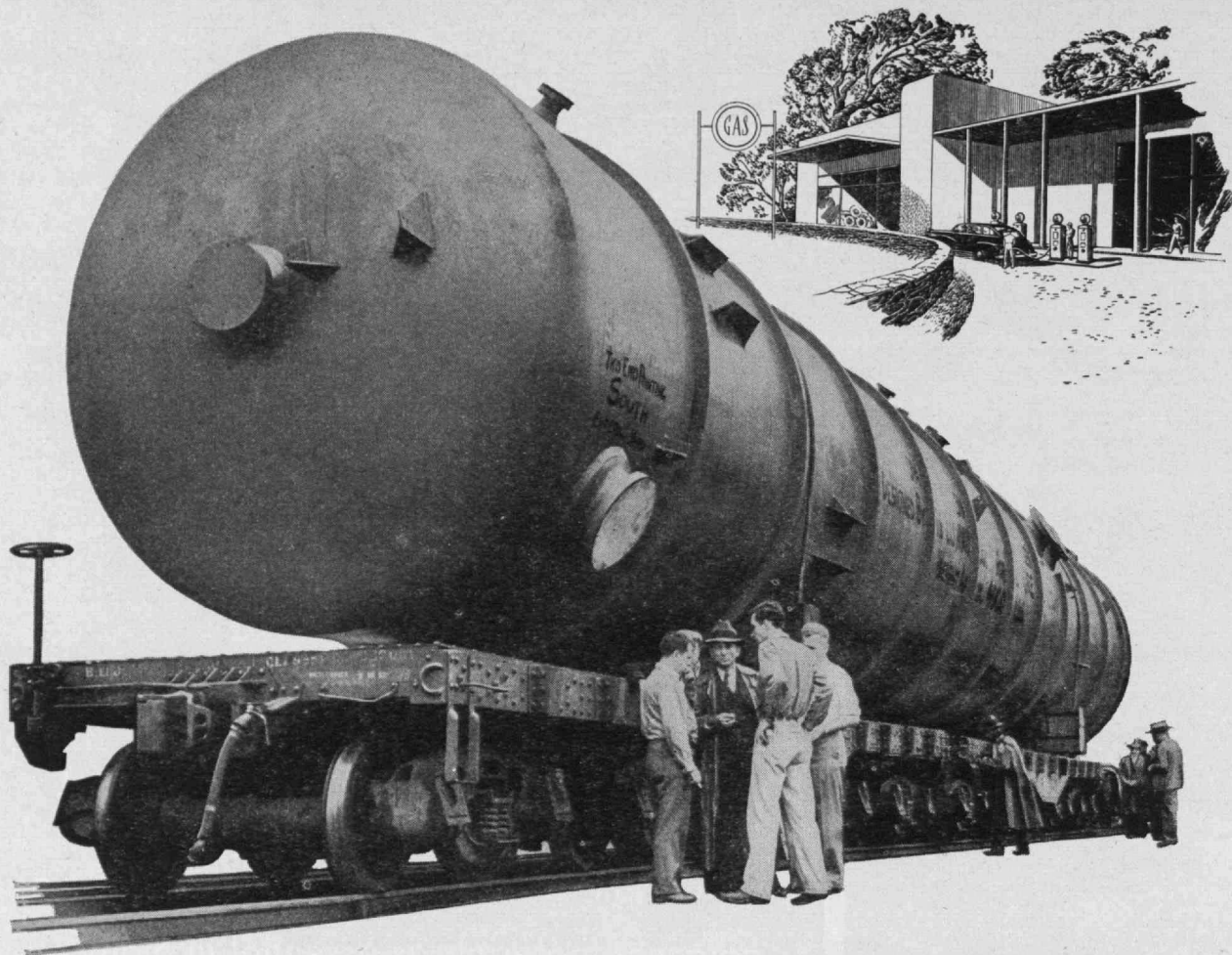
Non-staining carbon black . . .

which will not cause black rubber to stain adjacent materials, is essential in many phases of the rubber industry. Cabot has the right carbon black for carcasses of white side wall tires, for automobile window channels, refrigerator door strips and many other applications which require a non-staining black pigment.



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Metal Monsters

—that let you say, “Fill ’er up”

When you stop at a service station and say, “Fill ’er up”, it’s quite possible that your gasoline has been processed through huge C-E pressure vessels like the bubble tower shown above. This giant tower, built in the St. Louis shops of Combustion Engineering-Superheater, is 92 feet high, over 13 feet in diameter, and weighs 490,000 pounds.

This “metal monster” is by no means unique. Combustion has built hundreds of big pressure vessels, many for the largest and most modern oil refineries, and many more of various shapes, sizes and metal composition for plants in the chemical and other process industries.

Combustion’s contribution to the gas that flows into the tank of your car may seem to bear little relationship to its major field of steam generation, yet the association is direct and logical. For the facilities required to build boilers are identical to those used for the fabrication of pressure vessels—and the Company’s facilities for boiler manufacture are the finest available.

Whether the product is pressure vessels or boilers, industrial stokers or domestic water heaters—in many seemingly diverse fields, you will find the C-E flame symbolizing Combustion’s primary purpose — the more efficient utilization of heat.

B-253



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SUPERHEATER, Inc.**

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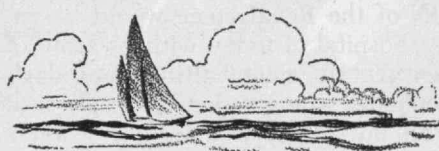
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In the days when cattlemen drove their stock across the unfenced prairie to the railhead, it was common practice among the least scrupulous to feed the cattle plenty of salt before they were offered for sale. When they were allowed to drink their fill, the gain in weight was the buyer's loss. Hence the term "watered stock" sensationalized in early days of corporation revelations and regulations.



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Are you selling "WATERED STOCK?"



WATER is just about our commonest material. In many places it is indispensable; in some places it is beautiful; but in others it contributes nothing but extra weight and the risk of depreciation. To send a six-ounce orange North from Florida freight must be paid on over five ounces of water which the North has in abundance — and then it must be eaten quickly before it rots.

BLOOD PLASMA

When World War II darkened the horizon Army doctors looked beyond the outright slaughter to the millions of wounded who might die in the field. Blood transfusion could save many but in a remote, devastated theater of war it was unthinkable — unless blood collected from a healthy population could be reduced, preserved, transported and reconstituted. To make this possible National Research Corporation took low temperature, high vacuum dehydration from the laboratory and developed it to the level of mass production.

PENICILLIN

Faced with an urgent wartime need for a universal antiseptic the English recalled the experience of Alexander Fleming with the blue-green mold, *Penicillium Notatum*. Under pressure the wonder antibiotic was accumulated — enough for a mouse, enough for a man, enough for twenty men — and then, grown by "kitchen culture" in millions of milk bottles, enough for an army. Again there was need for dehydration without heat damage and National Research's high vacuum process now installed in substantially all of the larger plants throughout the world, turned penicillin into powder at a rate to supply the world.



ORANGE JUICE

During the war we experimented with the dehydration of many common foods; meat, fish, vegetables, fruits, coffee. Of these orange juice was the most promising with a nationwide market ready and a world market waiting. We had produced citrus concentrate and powder on a pilot plant scale. Near the war's end we organized Vacuum Foods Corporation. For them we built and equipped a plant in Florida that now concentrates, for the national market, 75,000 gallons of juice a day.

This new industry, producing some 4½ million cans in the 1946-47 season

is expected to reach an annual production rate of 200 million in 1949. Within five years it is predicted that one-fourth of all Florida's oranges will reach their market as concentrated juice. In this industry Vacuum Foods is the pioneer and leader.

COFFEE



The success story of orange juice will, we hope, be rewritten for coffee. For over a year we have been producing in small quantity a "crystalline coffee" — pure coffee essence, nothing more and *nothing less*. This small production is being market-tested through the local retail trade and a steadily increasing number of users have found out that coffee *can* be reduced to an instantly soluble concentrate, and still taste like good coffee.

WHAT NEXT

To anyone who is selling "watered stock," not with guile but from necessity, National Research can offer a new prospect — lower cost methods of producing dry materials with instantaneously soluble structure. To apply our proven techniques of high vacuum dehydration National Research Corporation stands ready with a carefully chosen, experienced staff, with the newest equipment and with an accumulated knowledge of large scale low temperature dehydration that cannot be equalled anywhere.

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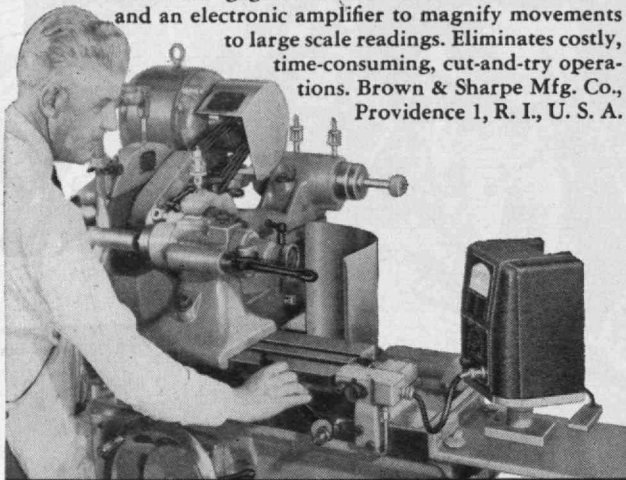
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This unique size-control aid uses a highly-sensitive strain gage to detect swivel table movements and an electronic amplifier to magnify movements to large scale readings. Eliminates costly, time-consuming, cut-and-try operations. Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.



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G E A R S

THE TABULAR VIEW

NO SALESMAN harasses those who patronize coin-operated vending machines, but this is a minor aspect of the growing business of selling by machines. As editorial associate of *The Review* and keen analyst of the social phases of scientific and technological change, PAUL COHEN, '35, traces the growth of mechanized selling (page 327) from its early beginnings in the penny arcades of the 1880's to today's supermarkets which are almost entirely automatic. It was during the 1930's that the various forms of slot machines outgrew their carnival attire and became a truly significant force in our social structure. Revealing his engineering training, Mr. Cohen attributes the recent rise in mechanized selling to such technological factors as mass production, carefully regulated coinage, standardized packaging, and the availability of highly reliable electromechanical assemblies. If mechanized selling has an important social effect in reducing costs of distribution, it has even greater significance in freeing persons from routine operations and making them available for tasks requiring creative talent which cannot be mechanized.

NO SURGEON of the Renaissance would be entirely at ease in a hospital of today with its array of modern equipment. Yet the mental attitude of today's medical men would be stranger than their physical equipment, for all but a few Renaissance workers were steeped in medieval thinking. The transition from medieval to modern medicine is traced (page 331) by DR. M. F. ASHLEY MONTAGU, a member of the faculty of the Hahnemann Medical College and Hospital of Philadelphia, and already well known to *Review* readers for his articles on varied topics in the field of cultural history. His present article points out how the inquiring spirit which led to the rise of the physical sciences had an equally important bearing in developing the era of modern medical science.

NO SCIENTIST has yet offered a completely satisfactory explanation of the origin of the green glasslike obsidian found in various parts of the world. The difficulties of finding a satisfactory explanation for its origin are somewhat akin to those of accounting for the properties of "the ether" or in choosing between the wave and the particle nature of light. First discovered in Bohemia, the green shards were alternately regarded as natural and artificial, and occasionally as both and neither! The fascinating chronicle is told (page 335) by WILLY LEY, editorial associate of *The Review* for several years and frequent writer on scientific subjects. Mr. Ley alternates his periods of writing with research. Having completed certain research at the Washington Institute of Technology, he has once more turned to writing as his primary vocation. To his credit are volumes entitled: *Rockets; The Days of Creation; Bombs and Bombing; Shells and Shooting; and The Lungfish, the Dodo, and the Unicorn*.

"—They perfect nature and are perfected by experience"—FRANCIS BACON



What these man-made gems mean to you

SYNTHETIC STAR SAPPHIRES like this one, which only the finest of nature's stones can equal, are now made by *man*.

Yes, Union Carbide—which since 1942 has made synthetic crystals for precision instruments and other industrial uses—today produces the loveliest of synthetic star sapphires *and* rubies for personal wear.

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Accuracy: Research .02 pH, Laboratory .05 pH, Industrial .10 pH. Other line-operated Cambridge pH equipment includes single- and multi-point indicators and recorders. Send for bulletin 910-MR.

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PRECISION INSTRUMENTS

MAIL RETURNS

Aviation Fire Hazards

FROM GEORGE H. TRYON, 3D:

I have read the excellent article "The Price of Haste" by W. Mack Angas and William T. Hardaker in the February, 1949, Review.

Our committee was particularly pleased to note the emphasis placed on the reduction of fire hazards in aircraft since this subject is the motivating force behind our committee activity. We are much in sympathy with the authors' opinion that detection and extinguishing devices are palliatives which reduce the danger without striking at the roots of the problem. The suggestion to expedite research and experimentation in the use of oil-burning Diesel aviation engines and turbines was particularly interesting to us.

There are many other features of the aviation fire problem which might have been mentioned in the article if space had permitted. The crash impact fire hazard is particularly severe, and we are convinced that loss of life in such accidents is primarily due to ensuing fire, rather than impact, in many cases where the impact forces are not of the highest severity. Our recommendations for aircraft rescue and fire-fighting equipment for airports reflect the magnitude of this hazard, and yet we are supremely aware of the fact that this equipment and its urgent need will do nothing to reduce the number of such incidents because the hazard is not being corrected by their provision.

*Committee on Aviation and Airport Fire Protection
Boston 10, Mass.*

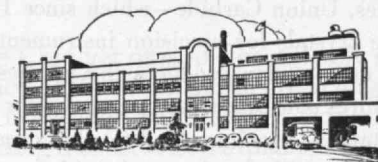
Contributions to Peace

FROM ALAN F. LYDIARD:

I was very much impressed with Donald J. Eberly's article "International Relations" in the November, 1948, Review. The National Student Association Committee and M.I.T. should be congratulated on their splendid contribution to universal peace.

Boston, Mass.

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Economy**



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Before you engage a builder, look into the character of his personnel. Our 6 key executives have been working together for many years. Our foremen have a comparable record of long training with the Company. This results in an efficient and cooperative organization—your assurance of speed, quality and reasonable cost.

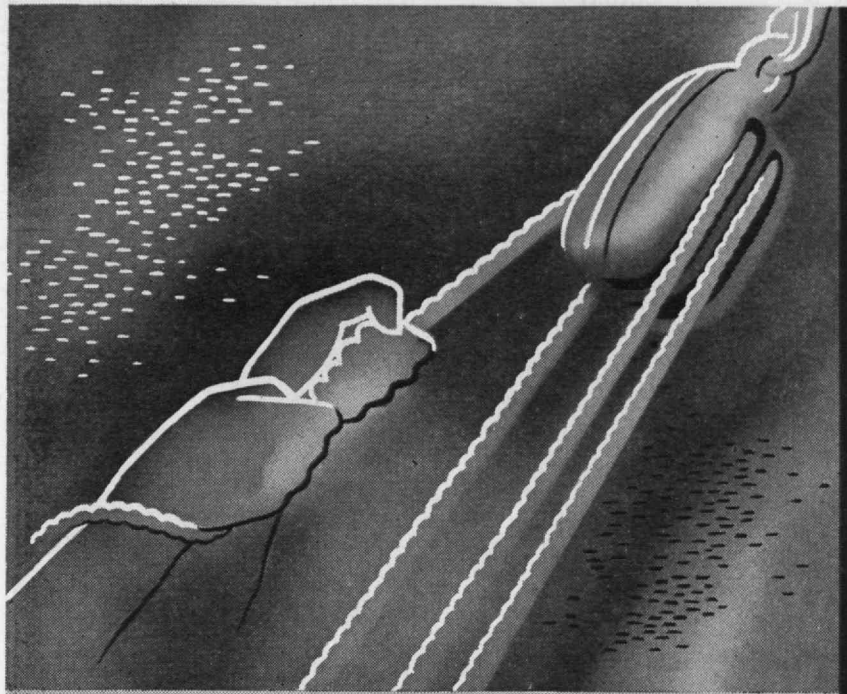
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INDUSTRIAL CONSTRUCTION

ALFRED T. GLASSETT, '20, *Vice President*



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Molybdenum steels may be just what the doctor ordered to reduce production costs, and still maintain the product's reputation for consistent performance.

Send for our comprehensive 400-page book, free; "MOLYBDENUM: STEELS, IRONS, ALLOYS."

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He's got the answers to your tire questions!

RIGHT from the start, you notice that Super-Cushions give you a much softer, more comfortable ride.

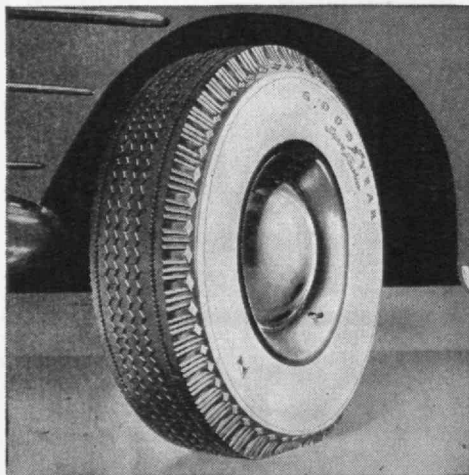
But you naturally want to know what kind of mileage they're going to give you, too. And Mr. R. W. Rogers, head of the Rogers Construction Co., in Portland, Ore., can tell you:

Mr. Rogers says: "Over a period of years, I've used nearly every tire on the market—and I find that Super-Cushions are giving me more mileage than any other kind.

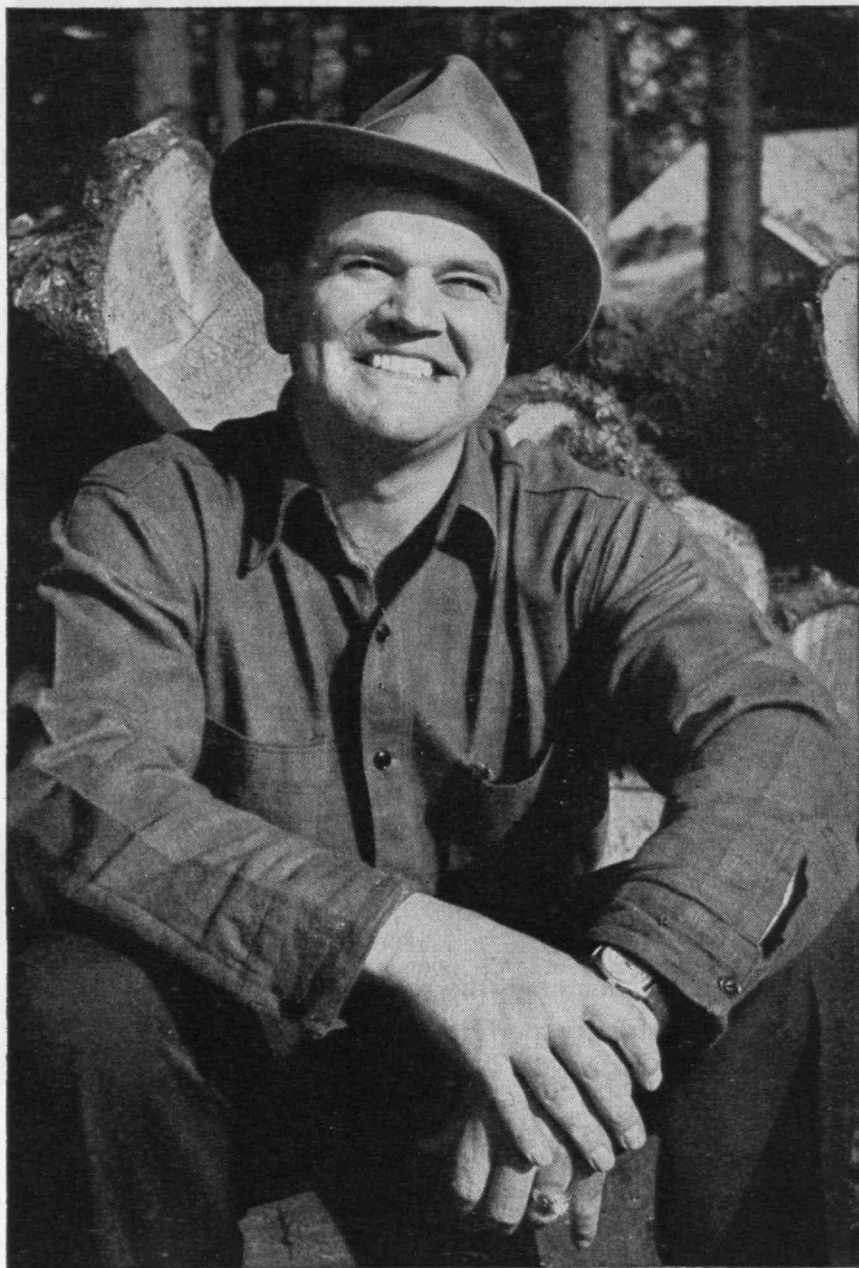
"It's amazing how much smoother they make your car ride, and how much better traction you get."




Softer ride! Super-Cushion is bigger and softer. It runs on less air pressure. It absorbs road shock, jars and vibration. So you get a pillowy ride, less car wear, and fewer rattles!



Greater Safety! Super-Cushions have a larger contact area with the road. So you get better traction, quicker stops. They'll fit your present rims. See your Goodyear dealer now!



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Fritz W. Neugass

Washington Bridge

THE TECHNOLOGY REVIEW

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EDITED AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

CONTENTS *for April, 1949*

VOL. 51 No. 6

AGE OF STEAM · *Photograph by Victor De Palma from Black Star* THE COVER

APRIL SHOWERS · *Photograph by Gustav Anderson from A. Devaney, Inc.* FRONTISPIECE 322

MECHANIZED SELLING BY PAUL COHEN 327
The engineer's ingenuity makes substantial contributions to reduction of distribution costs through the expanding use of coin-operated vending machines

RENAISSANCE MEDICINE BY M. F. ASHLEY MONTAGU 331
During the Fifteenth and Sixteenth Centuries a few hardy souls led in paving the foundations for the rise of scientific medicine

GLASKOGELS BY WILLY LEY 335
Still unsolved is the mystery of the origin of the pieces of green glasslike stones first found in Bohemia, but subsequently discovered in other parts of the world

THE TABULAR VIEW · *Contributors and Contributions* 316

MAIL RETURNS · *Letters from Review Readers* 318

THE TREND OF AFFAIRS · *News of Science and Engineering* 323

THE INSTITUTE GAZETTE · *Relating to the Massachusetts Institute of Technology* 337

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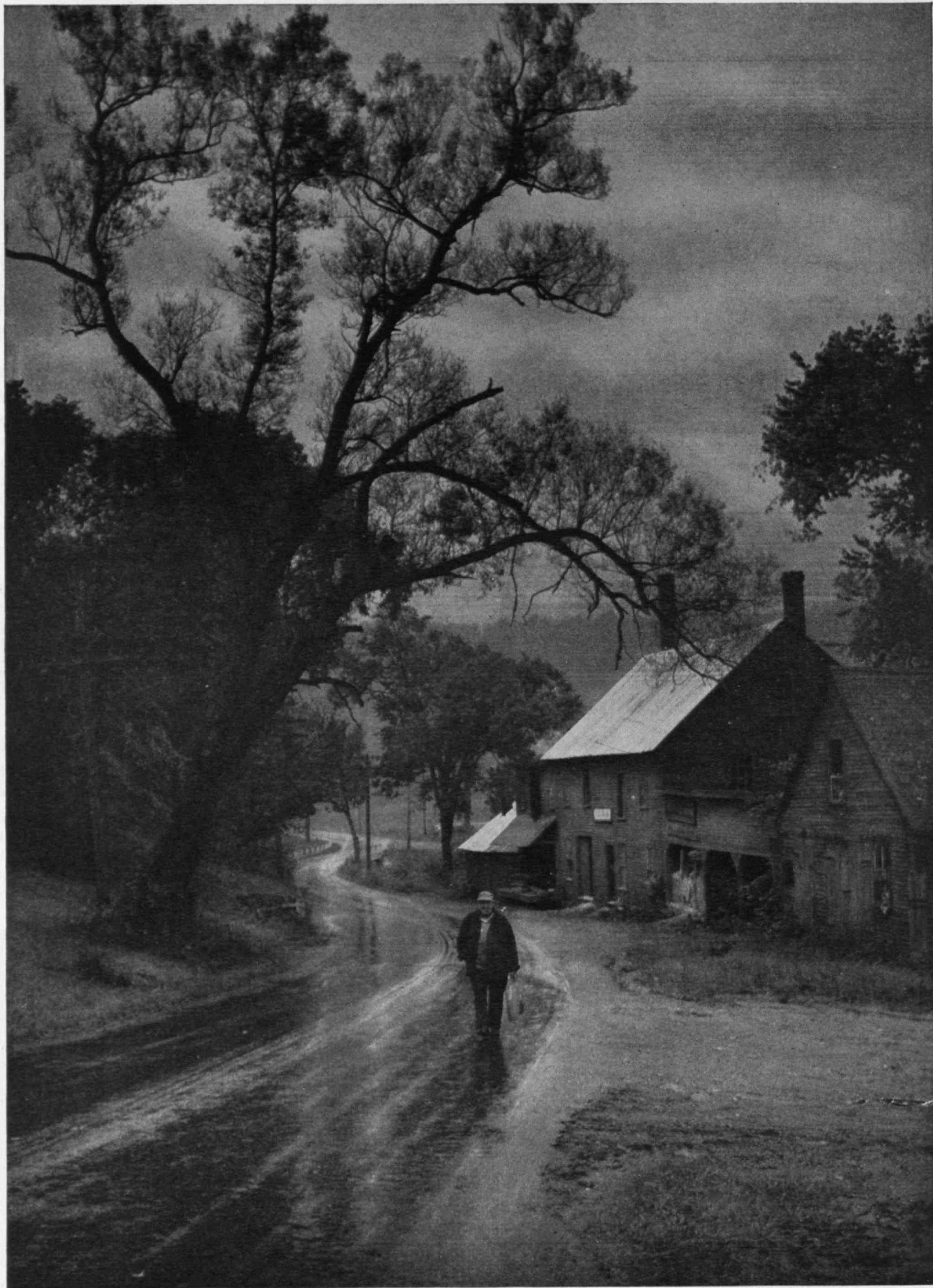
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Gustav Anderson from A. Devaney, Inc.

April Showers

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The Trend of Affairs

Public Health Agent

IN the United States, most diseases amenable to control by sanitation of the environment through engineering measures have declined steadily during the Twentieth Century. One disease in this category, endemic typhus, has moved precisely opposite to the general trend however. Endemic typhus is a febrile disease that is fully as debilitating to the human being as typhoid fever. Also known as murine (or rat-borne) typhus fever, this infection is spread by fleas that normally live on rats, but occasionally bite human beings as well.

Since 1913, when endemic typhus in this country was first reported in Georgia, recognized cases of the disease have grown steadily more numerous. In fact, during the early 1940's, reported cases increased at the rate of nearly 1,000 each year. Furthermore, known cases are only a partial indication of the true extent of this disease, since intensive local surveys have revealed that many cases go unrecognized, and that endemic typhus actually occurs at least two and a half times more frequently than reported cases indicate.

To date endemic typhus has been confined mainly to the South Atlantic and Gulf Coast states, with more than 67 per cent of the recognized cases occurring in 100 counties in that section of the country. Nevertheless the disease has spread inland slowly, with the result that certain southern cities, beyond the present focus of endemic typhus, are now actively engaged in programs to prevent its encroachment.

The only means at present available for coping with endemic typhus is the obvious one of eliminating the vectors — the rat and the rat flea. Rat control is, of course, a desirable objective for additional reasons as well, since rats convey other diseases, and also cause serious economic loss when they destroy or defile food-stuffs and other valuable materials. The basic method of controlling rats is the elementary and long-established

procedure of "building them out," through the construction of buildings with doors, windows, and other openings designed to exclude rats; with foundations built so that the animals cannot enter by burrowing; and with interiors planned to eliminate harborages that serve as hiding and breeding places. Sometimes alterations of existing buildings can render them ratproof. But unfortunately the economic obstacles to universal ratproofing are great. Rat-control programs must often rely upon a secondary and admittedly less effective procedure, that is, periodic attacks upon the existing rat population. Trapping and fumigation were formerly the principal methods for this purpose, but new and potent rodenticides, such as 1080 and ANTU have proved very effective.

A novel and truly extraordinary procedure currently used against endemic typhus is application of the insecticide DDT to kill the fleas on rats without destroying the rats themselves. This procedure is carried out by dusting DDT preparations in rat runs, harborages, entrances, feeding points, and other areas frequented by the pests. Studies conducted by live-trapping rats in buildings thus treated with DDT indicate that flea infestation of the animals may be reduced by this method to 15 per cent or less of its usual level, thereby greatly lessening the danger of endemic typhus transmission.

But antirat and antiflea campaigns have only transient effectiveness. A new population of rats quickly reinvades any cleared building that is not ratproof. Residual flea populations reproduce rapidly, and in time reinfest all of the local rats. Hence the only permanently effective means of eliminating endemic typhus fever, and other dangers from rat infestation, is the engineering measure of ratproofing all buildings. Thus the story of endemic typhus fever offers one cogent demonstration of the fact that the engineer, through his role in providing sanitation of the environment, remains an essential public health agent.



Philip Gendreau

Mission Accomplished

FEW men with prophetic vision, whose lifelong work is destined to have an important bearing on our way of living or thinking, are fortunate enough to see their dreams come to fruition. Still fewer live long enough to be able to witness the full impact of their work as it affects the lives of their fellow men. But prior to his death on February 23, Russell Williams Porter, '96, was one of those fortunate beings who could look back on decades of close association with the 200-inch telescope on Mount Palomar with the satisfaction of one whose work was well done. He did not live to see the huge telescope make any major contributions to knowledge, for several years will elapse before the large telescope will be operating at its full potentialities. But he did live to see the giant mirror dedicated last June, and recently he expressed satisfaction with the operation of the world's largest telescope. "I've seen enough to know the telescope is going to be better than we had thought," he commented, a few weeks before his death.

According to Ira S. Bowen, who heads the Mount Palomar project, the 200-inch telescope is already doing extraordinarily well in preliminary tests. Today, even with many final adjustments still to be made, it is regarded by its makers as a better instrument than the former world's largest telescope. Its promise for the future is exciting indeed, even though it is still necessary to rectify certain minor difficulties which invariably turn up in any complicated mechanism before it performs properly and before its vast potentialities can be tapped.

Already completed is the intricate work of assembling 500 tons of moving machinery, much of which has been built to tolerances previously unheard of in mechanics. A long running-in period is in progress, and the adjustments and design modifications that are inevitable in all pioneer work are clearly understood and already under way. There need be no concern because the huge glass disk has not yet quite attained its permanent figure.

The great Pyrex mirror, which weighs some 15 tons of itself, and more than 35 tons in its supporting cell, required 11 years of grinding and polishing at the California Institute of Technology to transform it from rough glass form to the world's largest astronomical reflecting surface. Considering that nearly four years were lost when the 17-foot disk was on "inactive duty" during World War II, the 11-year period is reduced to but seven years of active grinding and polishing. After work was resumed in 1946, John A. Anderson, who directed the process of disk shaping, would not admit success until he was sure that human hand could do no better. He and his colleagues realized that the instrument they were fashioning must be more perfect than any other telescope mirror ever before built, if the Mount Palomar disk were to work effectively in recording past events in the enormous depths of outer space. The freedom from aberration and astigmatism, coupled with the extreme resolving power required to study objects many millions of light-years away, could come only from the near perfection of the reflecting surface. When at last the parabolizing was completed in the laboratory, in September, 1947, all competent judges who had part in the project agreed that the goal of accuracy was in sight and could ultimately be attained.

It would indeed have been surprising had the mounting of the 200-inch mirror, in its intricate system of 36 supports, been accomplished with perfect ease. But within a year of completion, supports and drive mechanism operated satisfactorily under test. Attention could now be directed to the problem of making the final modifications in the shape of the mirror; to have neglected to make provision for final polishing after mounting could easily have resulted in years of delay.

When the shop work on the mirror had been completed, it was known that the outer edge was slightly higher than it should be by about 20 millionths of an inch. This excess of glass at the rim was intentionally left on since there was the possibility that the figure would be modified in operating position. No one could foretell exactly what the shape of the surface would be under operating conditions, and the excess of glass was on the safe side for taking care of any possibilities. To have perfectly parabolized the mirror in the laboratory would have been to risk the optical engineer's dread enemy. The only remedy for the "turned-down edge" would be to repolish the entire mirror, an operation which would probably take years to accomplish.

The slightly turned-up edge of the mounted mirror can be remedied by local polishing at the observatory in a few months. Final figuring by local polishing will not be risked, however, until every conceivable test has shown that corrections cannot be made in any other way, and until the effects of all possible distortions, however slight, can be studied with the mirror operating satisfactorily in its mount.

Certain minor temperature inequalities, for example, introduce slight distortions for which correction will be made by fans, and many other small modifications are expected to come to light gradually as the tests become more and more severe. The critical feature of the entire project is the precise parabolic figure of the mirrored glass surface. No hasty

action will be taken that might jeopardize the fine surface already attained.

When the Palomar eye is finished and looks out into space to record events billions of light-years away, what may be expected to result from the project which has cost \$6,000,000 and has required decades of planning on the part of a sizable staff of scientists?

The greatest contribution to be anticipated from the 200-inch mirror is in the extensions it will make to our understanding of the nature of the universe. In the hands of competent scientists and research workers, who can deny that the large mirror could change human thinking as much as the comparatively puny telescope in the hands of a Galileo or a Kepler changed the thinking of an earlier day.

Many men have labored brilliantly and patiently to achieve this great pioneer instrument. Utmost credit is due the scientists, engineers, and artisans who have been associated with the project. Many of these workers, like Dr. Porter himself, have spent a good portion of their lives in bringing the instrument into being. Dr. Porter's mission is finished, but those who are carrying on the work after him can join him in saying: "I've seen enough to know the telescope is going to be better than we had thought."

Chemistry in World War II

WORLD War I, it has been said, was the chemist's war, whereas World War II was the physicist's war. This epigram would appear to be confirmed by the fact that *Chemistry: A History of the Chemistry Components of the National Defense Research Committee 1940-1946*, edited by W. A. Noyes, Jr. (Boston: Atlantic-Little, Brown, 1948), is but one of a series of eight volumes entitled *Science in World War II; Office of Scientific Research and Development*. Nevertheless the tremendous volume and high quality of research, reported in the over 500 pages of fine type in

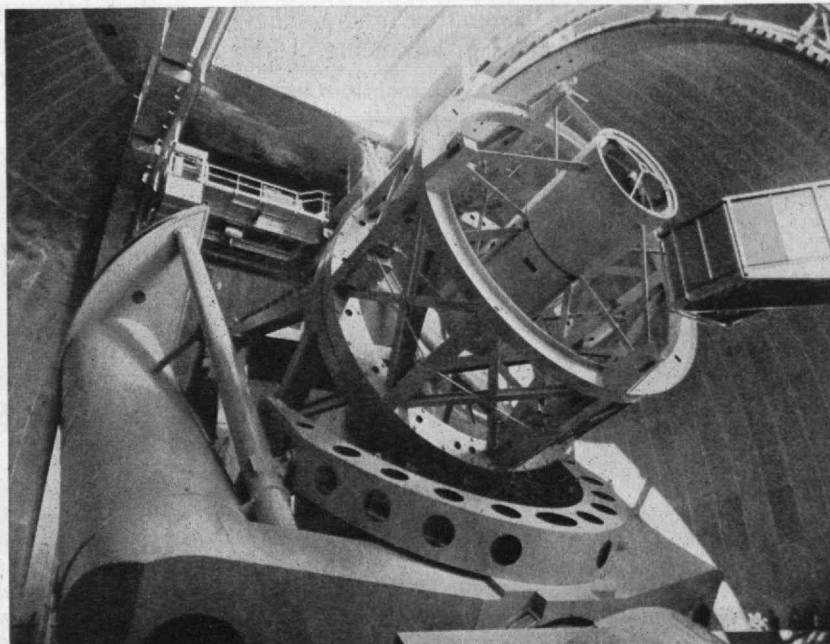
this volume, reveal that chemists and chemical engineers were essential contributors to the prosecution of the second World War. The chemistry activities of the National Defense Research Committee (later integrated into the Office of Scientific Research and Development) began, in fact, in June, 1940, coincident with the organization of the NDRC. Hence the chemical research components of the defense effort were well under way even before the National Guard was called to active duty.

Everyone with a professional interest in chemistry or chemical engineering will want to read *Science in World War II; Chemistry*. The technically specialized reader will find that the reports in this book are well classified into the following seven broad divisions: organization, explosives, chemical warfare agents, aerosols and screening smokes, oxygen problems, weapons for sabotage, and tropical deterioration. Each section presents, with total technical clarity, discoveries made during the six years of operation of the NDRC that in many instances either have been unannounced previously or known only through the often garbled medium of newspaper accounts. Furthermore, as background for elucidating advances, the nine authors who wrote this book frequently provide brief glimpses of chemical fundamentals that constitute a valuable refresher course in the subject. The chemist will also find of interest the complete tabulations of individuals and institutions that directed and carried out various phases of the program.

But even to the nonchemist, this volume is recommended for at least a cursory reading. It is, in no respect, the dry-as-dust research report. Most of it moves along with the flow of a good yarn, sketched against the dramatic background of world events during the immediate prewar and wartime years. Readability is enhanced by mentions of human interest angles of the problems encountered, such as the complications and frustrations regularly experienced by the NDRC chemists as civilians engaged in a crucial

The 200-inch mirror, in its mounting, dwarfs to insignificance the figures at the extreme lower right and in the central tube at the Mount Palomar Observatory. This huge astronomical camera is now nearing its time for use for research purposes, after being in the process of design and construction for decades. Foremost in bringing into being this newest tool for astronomical research were two Technology Alumni: the late George Ellery Hale, '90, entrusted with the construction plans of the project; and the late Russell Williams Porter, '96, affectionately known as "the artist of Palomar" because of his contributions to the architecture of the instrument pictured here.

Acme Photo



phase of the war. For example, strictest cloak-and-dagger secrecy was sometimes maintained concerning the fundamental significance of certain research projects, long after the armament involved was known to, and in use by, the enemy. At times the "uniformed men first" rule left the scientists without transportation to reach important field tests or demonstrations. Or on occasion, when NDRC chemists were housed in Army quarters for the purpose of carrying out field studies, they found themselves deprived of personal necessities, such as towels, because Army regulations provided such items through one procedure for enlisted men and through a different procedure for officers, but made no provision whatsoever for civilians! But then, to be sure, similar frustrations were experienced during the war by members of the armed services as well, and the only wonder is that such maladjustments were not more numerous and more serious in view of the global extent and great exigency of the war activities.

The accelerated tempo of chemical research, supervised by the National Defense Research Committee from 1940 to 1946, yielded a quantity of results that, under normal peacetime conditions, would have taken much longer to produce. Did these findings contribute exclusively to the arts of war? The main subdivisions of this volume, as listed previously, in general indicate that the research concentrated on fields of purely wartime value. However, a careful reading reveals that interspersed is a goodly leaven of results with permanent peacetime value. First of all, knowledge of basic principles was in some respects advanced. A random example in this category is fundamental advances in physiology resulting from studies of the effects of mustard gas upon enzyme systems in the living organism. Secondly, numerous practical discoveries produced by the NDRC program have long-term value. Among these are: antimalarial drugs and other medical agents, rodenticides, insecticides and insect repellents, and an unprecedented understanding of tropical deterioration. It is reassuring to be able to conclude that the staggering investment of money and time reflected in the chemistry components of the National Defense Research Committee program have had at least secondary values in advancing orderly scientific progress. — F.W.N.

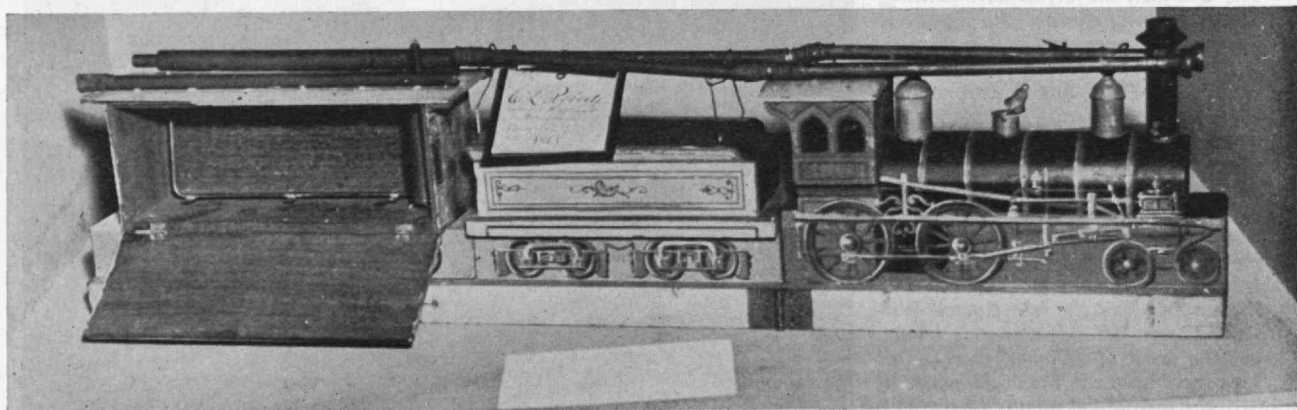
Applied Physics

IT is very difficult to appraise the book *Applied Physics: Electronics, Optics, Metallurgy*, as edited by C. G. Suits, G. R. Harrison, and L. Jordan (Boston: Atlantic-Little, Brown, 1948). Its chief function is to serve as a primary source of information for historians interested in analyzing the influence of science on World War II and of the methods employed by scientists in their organizing for the effort. Primarily, it is an administrative history of several divisions of the National Defense Research Committee: 13, 15, 16, 17, and 18. It is obviously a compendium of the writing of various authors collected into a more or less coherent book by the three editors who were also chiefs of the various divisions.

If the purpose of this book is clearly understood, the reader will not be disappointed to find the book completely lacking in humor or in any attempt to be entertaining. It is not recommended to the reader who wishes to relax by the fireside and enjoy a few hours of serious reading. Undoubtedly, a great many facts can be learned from the book. On the one hand it is interesting to a person of technical background who himself has taken part in war research. Such a person will learn, for the first time, what many of his friends were doing. He can now reflect how unfortunate were the circumstances which prevented him from finding out these things during the war when such information would have been of real use. For example, as the book points out, high-speed digital counters were developed during the war. They played no part in any military weapon; but were kept so secret that their use by other scientists was made impossible.

The book indirectly gives credit to the top administrative officers of the Office of Scientific Research and Development and National Defense Research Committee in giving each division of their organization the freedom to choose the administrative mechanism best suited for its purpose. One cannot help but be impressed by the multiplicity of people involved in the metallurgical work. In considering the vested interest and the many aspects of the metallurgical art, it is not difficult to see how such an organization was essential. On the other hand, the countermeasure

(Continued on page 342)



Keystone View Company

Shown here is a model illustrating an early attempt to heat railroad cars from the exhaust of the engine's smokestack. The heat-conducting pipes had flexible joints at the end of each car. This innovation of the early post-Civil War period must have left something to be desired in efficient utilization of heat!

Mechanized Selling

AIMS TO LOWER DISTRIBUTION COSTS

*Outgrowth of the Penny Arcade,
Today's Automatic Marketing Centers
Are a Direct Result of Engineering Ingenuity*

By PAUL COHEN

GENERALLY, it costs more to get an article from the factory into the hands of the ultimate consumer than it does to manufacture it. On the average, approximately 60 per cent of the price that is paid to the retailer goes to cover the expenses of distribution. In our efficiency planned, mechanized economy, perhaps odder still is the stubbornness with which the field of distribution has resisted the blandishments of technology until quite lately. In the last 80 years, the physical production of the factory worker has more than tripled, but the individual output per unit of time has changed virtually not at all in distribution. This indifference to technical progress, or at least to mechanization, has been illustrated in quite a striking way. In a report, recently prepared by the presumably unbiased International Labor Office, labor productivity in the United States is compared with that in Great Britain. This country is generally regarded as being more advanced in production equipment and technique than Great Britain. In such fields as manufacturing, transportation, and mining, American output per man exceeds British by from 215 per cent to more than 400 per cent. In distribution, however, the corresponding figure is only 150 per cent.

In spite of slow progress in the past there are indications that changes in methods of distribution are now being developed rather rapidly. One important, and still unchecked, trend toward lower distribution costs — self-service — started with the rise of supermarkets during the great depression of the 1930's. In an earlier era the innovation of the department store and the mail-order house also made significant contributions toward getting products into the consumer's hands economically. In novelty, and in their effect on the field, both of these Nineteenth-Century innovations had many of the earmarks of inventions. But both were more nearly the result of social evolution than of technical developments. On the other hand, the success of the self-service store and the supermarket was based on trends that can ultimately be traced to strictly technical advances. The immediate factors that aided the cafeteria form of retailing were such things as the greater mobility of urban and rural populations, the rise of the domestic refrigerator (permitting the purchase of perishable foods in greater quantities) and, no doubt, the rise of private automotive transportation, coupled with the shortening of the work week, so that time became available for a family expedition to a distant store.

In contrast to that of the self-service store, the success of the vending machine — and it is an exceptionally successful machine — is much more specifically an engineering achievement. Here the clerk is replaced not by the customer, as in a self-service store, but by an automaton — a machine.

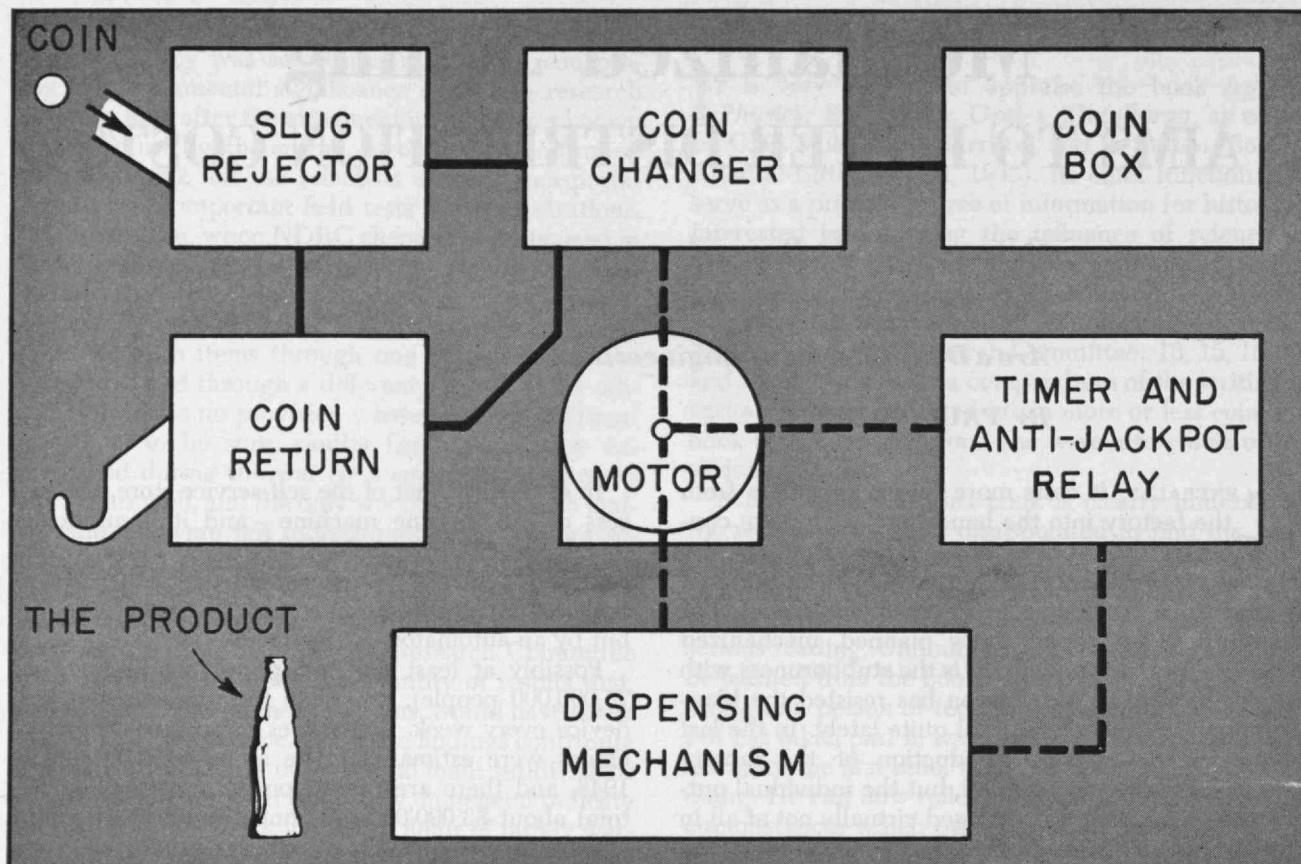
Possibly at least half our population (more than 75,000,000 people), use some form of coin-operated device every week. Gross sales through vending machines were estimated to be about \$750,000,000 in 1948, and there are predictions that such sales will total about \$3,000,000,000 annually within 10 years.

Like the supermarkets, vending machines date from the depression of the 1930's, for economic evolution, like its biological counterpart, appears to be accelerated by adversity. Although coin-operated games and even vending devices became an adornment of the penny arcades in the 1880's, more than half a century ago, not until the 1930's did they emerge as a significant outlet for consumer goods and services. The juke

Coin-Operated Vending Machines in Use

Type	Estimated Number in Use in 1948*
Venders of peanuts and other bulk products	1,500,000
Bottle soft-drink dispensers	385,000
Juke boxes	275,000
Cigarette dispensers	250,000
Candy-bar machines	230,000
Scales	200,000
Postage-stamp venders	150,000
Gum machines	100,000
Coin-operated radio receivers	75,000
Coin-operated washing machines	70,000
Popcorn dispensers	45,000
Dispensers of soft drinks in cups	22,000
Milk-dispensing machines	15,000
Cooky-vending machines	12,000
Ice cream-vending machines	3,500
Shoeshine machines	3,000
Cigar-selling machines	3,000
Machines selling apples	2,500
Aspirin dispensers	1,000
Fruit juice dispensers	500
Coffee dispensers	500

* Although these figures are compiled from sources believed to be reliable and well informed, the numbers given should be regarded as indicative, rather than precise.



Block diagram of typical coin-operated vending machine illustrating the relationship of functional units. The heavy solid lines represent the path which the coins take; the heavy dotted lines in the diagram indicate those units which are ordinarily actuated by motive power devices.

box, now so omnipresent that our less kindly critics point to it as a symbol of American culture, did not exist prior to 1933. Today we have in use at least 275,000 (some say 400,000) of these coin-operated, colorful and gaudy marvels. In the United States at the present time there are 1,000 aspirin venders; 1,500,000 venders of peanuts and similar bulk products; 250,000 cigarette machines; 3,000 cigar machines; 230,000 dispensers of candy bars. A full listing would be monotonous but the current situation may be summarized as follows: As of the end of 1948 there were about 623,000 coin-operated service machines, such as scales, phonographs, radio sets, washing machines, and shoeshine contrivances in use. There were about 400,000 machines vending solid edibles, from apples to popcorn. Machines dispensing liquids, either bottled or in cups, numbered about 423,000. As previously mentioned, cigarette and cigar dispensers number 253,000, the former being responsible for about 15 per cent (some estimates say 25 per cent) of this country's cigarette sales, whereas about 150,000 postage-stamp machines were in use last year. It is estimated that there is a grand total of more than 3,000,000 coin venders, excluding coin-operated telephones and parcel lockers.*

In an absolute sense, these are only moderately impressive figures when viewed against the background of American productivity. In the United States today there are about 20,000,000 refrigerators, 18,000,000 washing machines, and the overwhelming figure of

40,000,000 automotive vehicles. Nevertheless, the statistical status of the vending machine must be noted, for the importance of a machine — certainly its social and economic effects — can lie as much in its numbers as in its function. As evidence of this statement it is sufficient to recall that it took more than one Ford to create the gasoline era.

Function, nevertheless, is a reason why the vending machine deserves respect somewhat out of proportion to its numbers. The retailing operation is bounded by many more conditions than the usual machine is called upon to face. No matter how elaborate, most machines are merely tools that assist a human operator in his duties, and within their limitations, respond to his judgment and direction. The vending machine is one of an increasing number of devices that must automatically and reliably meet a repetitive but rather complex situation. In its matter-of-fact way, it is part of the modern industrial revolution. The automatic vending machine typifies the rise of automatic control systems, factories almost empty of personnel, servomechanisms of infinite variety, punch-card machines, digital computers, and other automatic mechanisms that, in the words of Professor Norbert Wiener,† are "bound to devalue the human brain at least in its simpler and routine decisions."

Entailing the making of numerous routine decisions every day, one of the fundamental functions of the retailer, is to make sure he gets paid for his product with the correct amount of sound money. In a vending

* These data are based on a private communication from the Coin Machine Institute.

† *Cybernetics*, page 45 (New York: John Wiley and Sons, Inc., 1948), \$3.00.

machine that problem is handled by a coin authenticator or a slug rejector. In the early days of machine selling, when a coin machine dispensed nothing more weighty than a penny's worth of peanuts or a chance to play another game "on the house," the occasional acceptance of a slug was not a matter of earth-shaking importance. Today, however, automatic vending machines are being used to retail items of considerable intrinsic value, or to return change from a coin of larger than the required denomination. Under such conditions it does not take a very large percentage of slugs or worthless coins to wipe out any economic justification for the automatic dispenser.

The compact and almost foolproof slug rejectors now used in the trade are standardized items made by only a few manufacturers, although there are currently more than 100 factories producing automatic dispensing machines. These rather complicated sub-assemblies are incorporated into the design in much the same manner as a relay, switch or electric motor, and the availability of such reliable, mass-produced components has helped mightily in producing machines that are economically and mechanically sound. Precision limit switches that are actuated by a very small force with a movement measured in thousandths of an inch have made a particularly helpful contribution in the development of mechanized selling. One design of coin changer, which is, of course, a much more complicated device than a rejector, contains four relays, one electromagnet, 12 switches, and one motor. Another requires five switches, four relays, four electromagnets, and two solenoids.

In effect, a slug rejector is a scientifically conceived obstacle race to be successfully negotiated only by a sound coin. But before the test can begin, the coin must enter the slot without jamming, and here appears one of the less obvious factors that have permitted the rise of the vending machine. The success of coin-operated mechanisms depends upon a carefully regulated coinage in which each coin is held to rigid specifications, is rapidly manufactured in amounts necessary to satisfy public demand, and is withdrawn from circulation as soon as it is observed to be defaced or badly worn. The extent to which the number of coins in circulation has increased during those years in which machine venders have had their greatest growth, may be gauged by production figures of the Federal Government. In 1932 the Philadelphia mint alone produced 14,500,000 coins, whereas in 1943 it produced more than 303,000,000.

In these days of mechanized selling, the need for uniform currency was irritatingly demonstrated in the epidemic of jammed turnstiles that followed the shifting of the New York subway fare from a nickel to a dime. It was nearly three weeks before bent and defective dimes were weeded out of circulation to a sufficient degree to return turnstile breakdowns to a normal level. But even a coinage which is highly standardized, precisely made, and adequately maintained will not eliminate all difficulties, for "wet coins from the fingers of perspiring riders were jamming some machines, as they always do in midsummer." Conductivity is one of the properties that are generally checked in a coin, but not necessarily in a manner that

would be interfered with by a surface film of moisture on the coin.

During New York's momentous shift in fares another sidelight on transit systems and coin machines was furnished when several hundred bus drivers balked at the twin tasks of driving their vehicles through city traffic while selling transfers to patrons at the odd and change-making price of six cents. In contrast to the discord which has so often marked the introduction of labor-saving mechanisms, comparative peace and quiet were reinstated when the Board of Transportation rushed into use about 400 coin-collecting machines and transfer machines.

Once a coin is sorted by denomination and fed to the proper circuit, it is checked for thickness, diameter, and weight. It also falls between the poles of a magnet which removes slugs made of iron or steel. In passing through the magnetic field, eddy currents are set up in the nonmagnetic slugs, such as those made of copper and zinc, and the good coins of copper, nickel and silver. These eddy currents slow down the passage of the coin in the machine, and the amount by which the eddy currents decrease the rate of fall of the coin depends on the conductivity of the metal. If the unit is set to accept nickels, the trajectories of the copper or zinc slugs will fall short of a strategically placed anvil. The nickel, striking the anvil, bounces into the "accepted" channel, there to perform its final and ultimate function of tripping the switch that sets the dispensing cycle into operation.

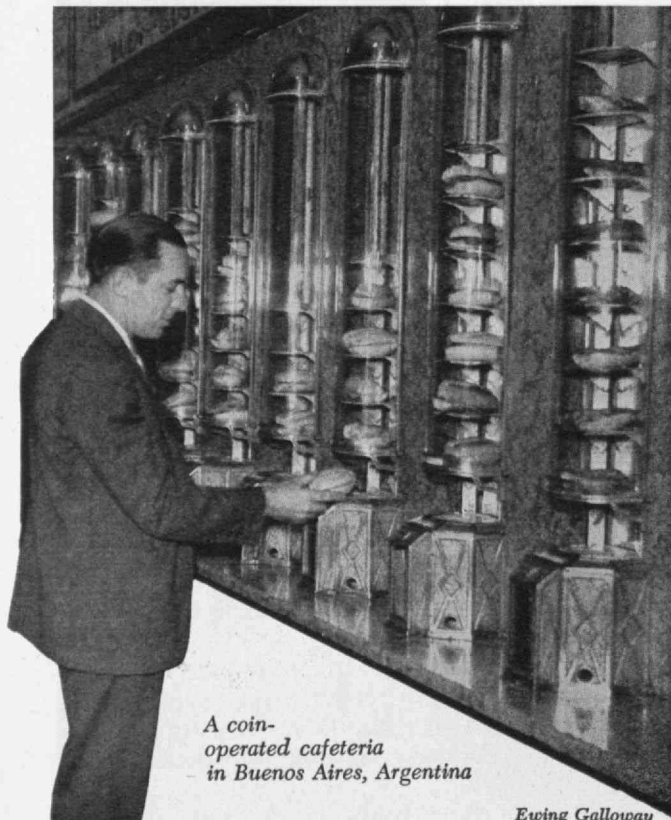
Ewing Galloway

Typical of coin-operated vending machines is this device for selling postage stamps.



Inserting the proper coin in the slot completes his task so far as the customer is concerned, unless the machine has been exhausted of its product. The initiation of the dispensing cycle does not end the problem for the machine's designer however. From California comes the story (horrible to a vending-machine operator) of the ice-vending machine whose duty was to dispense one 25-pound cake of ice after the insertion of two dimes. When one young man prodded this machine with the customary \$0.20 he was presented with not one, but 30 pieces of ice in succession. From one of the vending machine's less savory relatives (the slot machine or "one-armed bandit") comes the new verb, to jackpot, describing this phenomenon. Most of the newer vending machines now contain an "anti-jackpot" relay to prevent such occurrences of gratuitous plenty. Used in vending machines, an important variation of the coin testers is the change maker. This device will accept coins of larger denomination than the sales price, and will return the correct change. The ingenious customer is already using them to secure coins for telephone calls and other services. While not yet widely adopted, the change makers will greatly expedite the sale of goods through machines by permitting a wider and easily changed scale of prices.

Just as it depends on a standardized and jealously guarded coinage for its economic existence, the vending machine also requires the standardized packages, goods, and buying habits that characterize the distribution patterns of this country. Such standardized patterns often tend to restrict selection, of course. Nevertheless, the customer still enjoys the illusion of making a free choice. For example, operators have found that a popular brand of product will sell better if placed side-by-side with a number of competing brands, than if it were arranged in dignified isolation.



A coin-operated cafeteria
in Buenos Aires, Argentina

Ewing Galloway

Standardized products and containers have been integrated into the design and servicing of vending machines. Although it is conceivable that a vending machine could be built to dispense salt herring from a barrel, and wrap them in yesterday's newspaper, that form of packaging is not conducive to simple and satisfactory performance where sales are machine-made. So universal is satisfactory prepackaging in this country, and so obscured by advertising, that people do not always recognize the engineering features needed to make possible the generally inexpensive containers which enclose the products they purchase. Whether it is a can of soup, a pack of cigarettes, or a box of breakfast food, the package is rigid and capable of guarding the quality of the product for surprisingly lengthy periods. It has to be held to close dimensional tolerances or it could not be handled satisfactorily by automatic packaging machinery in the first place. Free of loose edges that might jam an intricate mechanism, these packages line up neatly in the racks of the vending machines and protect their contents long enough to permit servicing at reasonable intervals. In the reverse direction, the vending machine has already had its influence on the size and price of candy bars, for through such mechanisms about 10 per cent of all such confections are sold. As its numbers increase, the vending machine will undoubtedly influence package design in other fields.

Not the least advantage in expanding the acceptance of the vending machine is the ingrained consumer-buying habit of choosing something familiar. This purchasing characteristic has been developed over many years as the result of national advertising campaigns conducted by firms using the same trademarks and slogans for many years. To the extent that the customer does not have to be persuaded to buy a cup of fruit juice or a package of gum at a certain price each and every time he makes a purchase, the retailing function has become routine. Thus it becomes a natural field for mechanization.

Although the vending machine can dispense almost any item that can be paid for with coins, none has so far been invented that will read paper money. Yet, in spite of this limitation, an obvious extension of machine selling—mechanized stores—is now being studied. The proposed stores could be essentially a collection of vending machines but probably would become a co-ordinated system of coin-operated distributing mechanisms. Trends toward both goals are in evidence. Operators of laundrettes are already experimenting with methods for making a more complete utilization, so to speak, of the crowds that gather in those establishments where batteries of coin-actuated, automatic washing machines may be rented by the general public. Already some laundrettes are being equipped with vending machines from which ties, hosiery, and coffee can be purchased while the customer's clothes undergo cleansing. One sympathizes with these operators. The sight of a live and healthy customer, whose pocketbook is out-of-reach, must be nerve-wracking.

The whole-hog approach to machine selling, on the other hand, is exemplified most emphatically by the

(Continued on page 355)

Renaissance Medicine

Like the Physical Sciences, Modern Medicine

Had Its Origin, about five centuries ago,

in the Rise of Experimental Research

By M. F. ASHLEY MONTAGU

THE Renaissance is a period which saw the rebirth (and that is what the word "Renaissance" means) of a new spirit of inquiry, not only in medicine, but also in all other contemporary branches of theoretical and practical knowledge. It was not medicine which initiated this new spirit of inquiry, but rather medicine was caught up with other branches of knowledge in the spirit of the time and carried forward by men who had become more or less imbued with that spirit.

What are the qualities which characterize that spirit? In a phrase they may be described as a critical, and often skeptical, attitude toward authority as such, particularly that derived from books, and the development of a free independent spirit of inquiry into things themselves. This spirit is not entirely novel to the Renaissance, for to some extent it is evident in the work of schools and individuals here and there during the Middle Ages (200 to 1400 A.D.). It may be seen in the accomplishments of the Salernitan school of medicine¹ from the Eleventh to the Thirteenth Centuries, and in the writings of such men as Roger Bacon (1214-1294) and Nicolaus of Cusa (1401-1464).

History is largely a matter of ideas in interaction passing through the alembic of men's minds and expressing themselves as acts. The series of events initiating this discussion of Renaissance medicine commences with the attack upon the fortress state of Constantinople in 1451 by Mohammed II, Lord of the Ottoman Empire and the terror of Christendom. At this time, Constantinople was the European repository of almost all that remained of ancient Greek learning. The language of court and church was that of Fifth-Century Athens. In May, 1453, Constantinople fell. The libraries, stored with Greek manuscripts were destroyed, although some of their contents were saved by their custodians who fled with them — mostly to Italy.

In a land rich in merchant princes and humane tyrants anxious to encourage the revival of classical learning with the benison of their support, the arrival of such Greek-reading scholars, laden with their precious wares, was a most fortunate concatenation of events. The appearance of these intellectuals had an enzymatic effect in accelerating the change which had been slowly developing in intellectual Europe. Clerks were busied copying the new manuscripts, and the refugee scholars were occupied in translating and interpreting them. So occupied for the next century, these men were able to spread the light of the classi-

cal world and humanize the medieval world by means of the new invention of printing (1444-1454). But, as Sir William Osler² put it: "One cannot say that for the first twenty-five years of its existence printing did much, if anything, to free the profession from the shackles of mediaevalism. Not until the revival of Greek studies did men get inspiration from the true masters of science, and for at least two generations they were too busy looking for the fountains to explore for themselves the virtues of their waters. The accurate observation of nature which Aristotle taught, the searching out of her secrets by way of experiment which the Alexandrians and Galen practiced, were the great achievements of the Sixteenth and Seventeenth Centuries, as exemplified in Vesalius and Harvey." However, there can be not the least doubt that the printing of more recent as well as the classical works in medicine, such as those of Hippocrates (1473), Galen (1475), and Celsus (1478) greatly assisted men toward the development of the scientific attitude of mind — that questioning mood which takes nothing for granted until it has been adequately tested and verified.

We may say that the effective, though slow, development of this mood affected medicine during the first half of the Fifteenth Century; an attitude of mind, which was to blossom in the Sixteenth Century, and become systematized in the heroic age of science in the second half of the Seventeenth Century.

To the end of the Fifteenth Century, medicine was still medieval in character — an amalgam of magic, superstition, empiricism, and slavish adherence to authority. The supreme medical authority of the Middle Ages was the Second-Century Greek-Alexandrian physician, Galen of Pergamum (130-200 A.D.). His writings — imitated, abstracted, and commented upon — multiplied into a colossal medical literature. Medical teaching consisted largely in the reading by the lecturer to the assembled students, of Galenical texts and commentaries upon them. Galen dealt with practically every branch of medicine, and a contemporary study of his works would leave little doubt, in the mind of anyone who undertook it, of the greatness of Galen as an original mind, as a biologist, and as a systematizer. It was no fault of Galen's that the Middle Ages slavishly followed him rather than improved upon his example. Deviation from the teaching of Galen was considered a heresy, and so it came about that throughout the Middle Ages, and certainly



Singer and Rabin: A Prelude to Modern Science

The frontispiece of Johannes de Ketham's *Fasciculus di medicina*, published in Venice during 1943, provides an insight into the teaching of medicine at Padua University during the Fifteenth Century. Surrounded by Greek and Arabian classics on medicine, from which his discourses are derived, the lecturer in his chair addresses medical students. Patients seeking treatment are shown in the foreground.

throughout the Fifteenth Century, what the medical student received was based largely on what Galen had written during the Second Century A.D. The student never dissected a body. Dissection was done by a demonstrator who followed the directions as delivered by the lector from his elevated pulpit or cathedra. The most popular text in anatomy was that of Mondino de Luzzi (c. 1275–1326) or Mundinus. His *Anathomia* was written in 1316, and was the first of the practical anatomies. After circulating in manuscript version for 162 years it was eventually published at Padua in 1478. The restorer of anatomy, as Mondino was commonly called, drew his information almost entirely from Galen, Theophilus, and the Arabic authorities. His physiology was almost entirely Galenic. Anatomy and physiology, it may be recalled, were taught as one subject up to the middle of the Nineteenth Century. Up to the middle of the Sixteenth Century knowledge of the structure and functions of the human body was extremely crude. A large number of fairly obvious structures were not known at all, while many organs were described from the dissection of such animals as monkeys, pigs, and sheep.

Surgery was taught principally from the *Chirurgia Magna* of Guy de Chauliac (c. 1300–1368) which was written in 1363. This, too, was a compilation based on the work of some 88 authorities. It was first printed at Lyon in 1478. The work consists of seven tractates. The first treatise consists of an introduction to anatomy. This is followed by a discussion of the treatment of carbuncles, abscesses, tumors, and cancer. Bubonic plague is attributed to the Jews, who according to Guy, wish to poison the world, and also to certain conjunctions of the planets. The contagious nature of the disease is recognized, and venesection, purification of the air, and good diet are recommended. The various kinds of wounds are then discussed, and the methods of treating and suturing them. Ulcers are next treated, and a discussion of fractures and dislocations follows in which de Chauliac advises the treatment of fractured limbs by suspension in a cradle, and fractures of the thigh with splints, pulleys and weights. The sixth tractate deals with local pathology from the surgical point of view, with chapters on such diseases as leprosy, sciatica, the special sense organs. The seventh and final tractate supplies a very comprehensive antidotary of some 750 different substances. It is of interest that in this work Guy deals with anesthesia. He writes: "Some people, like Theodoric, speak of sleep-producing drugs, so that the incision is not felt, such as opium, belladonna juice, hyoscyamus, mandragora, tree-ivy, hemlock, and lettuce; they soak a new sponge in these juices, and let it dry in the sun. And when they have need of it, they put this sponge into hot water, and give it to a patient to smell until he falls asleep. When he is asleep they operate, and afterwards with another sponge soaked in vinegar held to his nose, they awaken him." Such anesthetic procedures were in use throughout the Middle Ages down to the end of the Fifteenth Century, whereafter, for some unknown reason, they seem to have disappeared from practical surgery.³

As the standard treatise on the subject, the *Chirurgia* fixed and retarded the teaching and practice of surgery for 200 years. The general level of internal medicine during this period was below that of surgery, and inferior to that of Greece and Rome. Indeed, much that the Greeks and Romans already knew had been forgotten during the Middle Ages. Galenism and the Hippocratic humoral theory reigned supreme.

According to the humoral theory there are four cardinal humors which constitute the fundamental elements of life and of the living creature: the first is the blood, which issues from the liver, and represents heat; the second is the phlegm, which comes from the brain, and represents cold; the third, the yellow bile or choler, represents dryness and comes from the gall bladder; the fourth is the black bile, or melancholy, which comes from the spleen and stomach and represents wetness.

When these humors are harmonically mingled (crasis), the body is in a state of health; when there is a defect or irregularity in the mixture (dyscrasia), disease arises. In constitutional normal excess the "complexio" or temperament of the person was held to correspond to one of four types: the sanguine, the phlegmatic, the choleric, and the melancholic.⁴

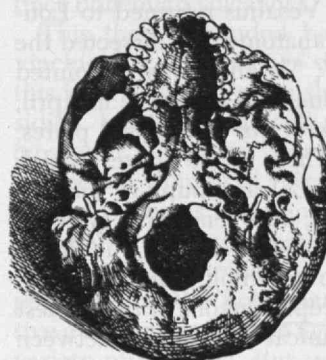
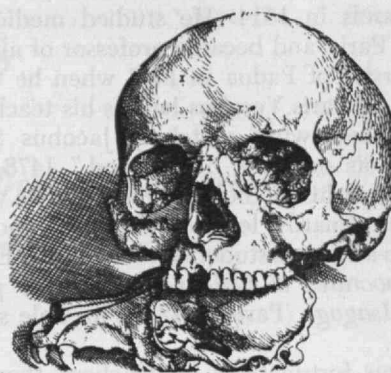
The color density, odor, and form of the blood, of the sputum, and above all the urine, gave the Fifteenth-Century physician all the information he needed to make a diagnosis. Bloodletting or cupping, and uroscopy therefore flourished. The urine, as seen in the collecting vessel, was divided into four layers, each corresponding to a region of the body: thus the upper layer corresponded to the region of the head; the lower, to the urogenital organs. Bloodletting reached a fine art, while such tortures as blistering, cauterizing, scarification, and the use of the seton and fontanelle were common practice.* The seton was used by making two parallel incisions in the skin, usually on the neck, and by drawing a thread or piece of linen through the channel thus made. By thus drawing this material through the wound a constant irritation could be kept up. This was believed to counter any skin irritation. The fontanelle was a small scarification which was kept open by the insertion of a pea or bean or similar foreign body. Numerous drugs drawn from a wide range of sources were in use, and their functions frequently correctly known. The magical belief in the virtues of precious stones, bezoar stones, and pearls was widespread.

To sum up, the medicine of the Fifteenth Century consisted largely of a mixture of magic, superstition, *post hoc* inference, and an abject adherence to experimentally untested traditional doctrine. The large and commodious hospitals which were first built during the latter part of this century were intended to alleviate the miserable lot of the poor sick, and were an expression of the dawning humanism of the period. The medicine of the Fifteenth Century was the medicine of the Dark Ages, and forcefully illustrates the truth that when men abdicate their hard-won right to think freely and to weigh evidence independently — no matter how challenging their conclusions may be to entrenched orthodox theory and doctrinaire practice — they lose not only the ability to gain new knowledge but forget the best of what has already been acquired. With the discovery of the wealth of ideas contained in the classical texts which broke upon the intellectual horizon of the latter half of the Fifteenth Century, the stimulus toward the rebirth of the independent spirit of inquiry, of observation, and of criticism began slowly to work like a ferment.

That there was in the Fifteenth Century an independent spirit like Leonardo da Vinci (1452–1518), pursuing investigation into the anatomy and physiology of the human organism and piling original discovery upon original discovery in the best spirit of the modern scientist, is a tribute rather to the supreme genius of Leonardo, whose work remained unpublished until the Nineteenth Century, than to the ethos of his time.

In passing it is necessary to observe that the Fourteenth and Fifteenth Centuries were periods during which the unity of religious theory was in process of breaking up. The subsequent disunity prepared the

* The practice persisted until the middle of the Nineteenth Century, as may be seen from such an article recommending it as late as 1843. G. Wallis, "Some cases showing the advantage of powerful counter irritation, especially the long issue on the calvarium," *Transactions of the Provincial Medical and Surgical Association* (London), II:307–336 (1843).



A wood engraving from *De Fabrica* of Vesalius, published in 1543. Illustrations such as this established a new high standard of accurate portrayal and artistic ability in the medical works of the times.

way for the Reformation of the early Sixteenth Century, and also assisted in providing that intellectual climate in which new and challenging ideas and practices could obtain a bearing free from the bonds of ecclesiastical scholasticism.

The new spirit of Renaissance medicine did not spring suddenly into being but had its beginnings in the Fifteenth Century with a period of transition extending from the latter half of the Fifteenth to the beginning of the second half of the Sixteenth Century. There is one work which can be said to mark the birth of modern medicine, however. That work is the *De Humani Corporis Fabrica* of Andreas Vesalius. The *De Fabrica* is the foundation stone upon which the great superstructure of modern medicine has been erected. It is a complete textbook of human anatomy. In addition to being the most important medical book ever published it is also perhaps the most beautifully printed. This magnificent work was published on June 6, 1543, at Basel† in Switzerland when the author was in his 29th year.

André Vesal, or in the Latin form of his name by which he is universally known, Andreas Vesalius, was

† A few days earlier at Nuremberg *De Revolutionibus Orbium Coelestium* of Nikolaus Copernicus was published, May 26, 1543.

born at Brussels in 1514. He studied medicine at Louvain and Paris, and became professor of anatomy at the University of Padua in 1537 when he was 23 years of age. At Paris Vesalius had as his teacher the brilliant, but somewhat crotchety Jacobus Sylvius (Jacques Dubois or "Jock o'the wood," 1478-1555). Sylvius, who took his medical degree when he was 51, was an extraordinarily learned physician and commentator who attracted students from all over Europe. His *In Hippocrates et Galeni physiologiae partem anatomicam Isagoge* (Paris, 1642), is an able systematic anatomy.

Vesalius was fortunate in his teachers, though he afterwards criticized them not without some severity. In any event Vesalius did not like the manner in which anatomy was taught since it provided practically no opportunity whatever for the student to do his own dissection. Nevertheless Vesalius himself tells us that because of his superior skill he was asked by his teacher and fellow students to dissect the body for them. This was in 1535 and 1536. In the latter year the medical school at Paris dispersed, owing to the invasion of Provence by Charles, and Vesalius returned to Louvain where he lectured on anatomy and dissected the body. In December, 1537, Vesalius was appointed professor of surgery at Padua, and at Venice in April, 1538, he published a work of six anatomical plates, *Tabulae Anatomicae Sex*. Three of the figures, which were made by Stephan van Calcar a pupil of Titian's, showed the portal, vascular, and generative systems, and the remaining three, the skeleton. The latter plates were far superior to anything that had previously been published, and represent one of the earliest attempts at accurate anatomical delineation. Between 1538 and 1542 Vesalius was engaged upon the writing

of his *De Fabrica*, and, as we have already said, this was published in June, 1543.

In *De Fabrica* we have, for the first time, a consummate textbook of human anatomy, illustrated with the most superb figures. Indeed the illustrations have never been surpassed in beauty and up to that time had not been anywhere nearly as accurately done. The book which constitutes the great foundation stone of medicine is at one and the same time the first work which exhibits the true method of science. In this work Vesalius proved that progress in medicine required research. The workings of the human body were not to be learned from books, but by going to the book of nature itself, the working of the human body could be learned by investigation and observation based on experiment. The importance of *De Fabrica* in putting human anatomy on a firm scientific foundation cannot be overemphasized in the subsequent development of medicine, for anatomy was and is to medicine what the alphabet is to reading and writing. Without the one it would be impossible to grasp the other.

Vesalius was a genius and a somewhat conceited and bumptious young man, as geniuses sometimes are apt to be. The preface to his book becudgels and belays the medicine of his day and its practitioners. It overexaggerates and overclaims, and makes insufficient acknowledgment of the work of his predecessors. Moreover, Vesalius was not one to hide his light under a bushel, and he pretends to a knowledge of Greek, Arabic, and Hebrew, which he did not possess. There is a good deal of fustian in his work and much that is Galenic. The spirit of the red-cheeked, apple-stealing bright boy who is the only one who knows how the model-T Ford and the radio set work is very evident in his preface. Vesalius' attitude and lambastings did not sit well with some of his contemporaries, and there are some who hold that it were better if his preface had never been written. On the whole, its effect was probably good. It annoyed some fools and caused them further to prove themselves the kind of dunderheads Vesalius said they were. An outspoken man is, of course, rarely popular, and while his book did little to advance Vesalius himself, it was immediately accepted by those who could value such works for the great contribution to knowledge which it was. With its publication the modern era in medicine can be said to have begun, and Copernicus' *The Revolution of the Heavenly Bodies* and Vesalius' *Construction of the Human Body* are to be regarded as the two works marking the renaissance of modern science.

The work of distinguished predecessors — such as Giacompo Barengario da Carpi and Nicola Massa — influenced the development of Vesalius but to these men he makes little or no acknowledgment. Giacompo Barengario da Carpi (c. 1470-1550) completed his *Anathomia Mundini* in 1514, and *De Calvariae* in 1518. His *Commentaria*, published in 1521, is the earliest anatomical work with figures illustrating the text, and a later work, *Isagogae Breves* which appeared in 1522 is the first anatomy illustrated in the modern sense. These books are all highly original works. Nicola Massa (c. 1480-1569), general practitioner of Venice, is another to whom Vesalius was

(Continued on page 346)



Castiglioni: A History of Medicine

Copper engraving of Paracelsus, whose insistence on careful observation and experimentation during the first half of the Sixteenth Century greatly aided in establishing medicine on a scientific foundation.

Glaskogels

From Whence Came the Bohemian Green Glass Shards?

Several Hypotheses Have Been Advanced but

the Mystery Still Remains Unsolved

By WILLY LEY

FACING me, while writing this, there is a small glassine envelope, such as stamp collectors use. It contains a small sliver of a glassy substance, about as large as a fingernail and slightly thicker than a nickel coin. Its color is a beautiful dark green, especially when you look through it, and it is quite heavy. The correspondent who sent me the piece wrote that his father, an immigrant from Bohemia, picked it up in a field in his native country many years ago. His son now wants to know whether it might be a moldavite. Considering circumstances and appearance, it probably is, although it would need examination with a microscope and even chemical analysis to be absolutely certain.

The story behind those green glassy shards that could be (and probably still can be) picked up from Bohemian fields when a ditch was dug, or when a small stream bit a few feet deep into the surface soil, cannot be said to have a real and definite beginning. To the Bohemians these green shards "were always there" and, when encountered, were as little reason for surprise as is the finding of a piece of amber to a fisherman on the shores of the Baltic Sea. The unfortunate difference was merely that a piece of amber had commercial value while the green shards did not. Still, they must have acquired some fame as local curios because their existence was mentioned by Johann Wolfgang von Goethe in his miscellaneous scientific writings where he said: "the so-called Bouteillensteine is found at Kornhaus near Schlan." The geographical location mentioned is Bohemian, while the French-German hybrid word *Bouteillenstein* means "bottle stone," — green glass.

The pieces of green glass found were never large; a piece that could be compared in size to an egg was already very unusual. The majority varied in size between a hazelnut and a walnut. Many had a blackish crust as if the surface, and the surface only, had been molten at one time. A few looked almost like Prince Rupert's drops with a long tail. Those that had a black crust often showed little cusps in that crust, as if a bellows had blown against it when it was soft. Most of them were simply broken pieces, just like shattered glass. Chemical analysis proved that they were glass; most precisely, they were of the type of glass which is better known as obsidian or volcanic glass.

Once this became known, the mystery of the shards seemed to have been solved. In the meantime they had been given a name. Since they came from Bohe-

mia, and Bohemia's best known river is the Moldau or Moldova, they had been named "moldavites." It was found that the shards greatly resembled volcanic glass chemically, and there were a few extinct volcanoes around. Hence it came easy to believe that the moldavites were leftover results of former activity of now extinct Bohemian volcanoes.

This theory sounded beautifully simple and convincing, but a few things simply refused to fit in with this idea. The Bohemian shards greatly resembled obsidian, but there was still a difference, literally a microscopic difference. True obsidian, taken from the immediate vicinity of volcanoes which once produced it, always shows large numbers of fine crystallic needles imbedded in it when examined under the microscope, but the moldavites did not. Of course, it was possible that the Bohemian volcanoes, when still active a million years or so ago, had produced a different variety of obsidian. But why did all other volcanoes produce shards of the same type, and all with needles?

Which Bohemian volcanoes yielded these green pieces was another very puzzling question.

Moldavites were first known to be comparatively plentiful near Budweis in the area of the Upper Moldau. A second area, a few miles wide and about 30 miles long, was then discovered in Moravia, east of Trebitsch. Both regions combined covered an area more than 100 miles long but only 10 to 15 miles wide, if that much. Had there been a line of extinct volcanoes extending through the approximate center of that area the theory of volcanic origin could have been supported. But there were no extinct volcanoes near the Bohemian end, and certainly none at the Moravian end of the region in which the moldavites were found.

Meanwhile, enterprising Bohemian jewelers had put the shards to use. They were easy to grind and looked very beautiful when faceted. At first the use of moldavites for jewelry may have been undertaken in the spirit of honest imitation; they made fine substitute emeralds for those who could not afford real ones. Because of their beauty they quickly came into demand and "Bohemian chrysolite" became an article of commerce. Probably for the sake of those who might stumble over the word "chrysolites" they were also labeled "Bohemian green garnets."

A new hypothesis came into being when Alexander Makowsky of Brno, or Brünn, declared that those green stones were neither a variety of chrysolite, nor a kind of garnet, or a species of obsidian; in fact that

they were not natural stones at all. He pointed out that they differ in structure from obsidian and that there were no extinct volcanoes around to begin with, even if one admitted that the Bohemian volcanoes should have been the only ones to produce a different kind of obsidian. On the other hand, Bohemia has always been famous for its glass. Bohemia not only produces very beautiful and very famous glass, but also large quantities of it. Thus did Makowsky conclude that moldavites are merely remains of an old and forgotten Bohemian glass industry. True, historical records did not say anything about such an industry, but this was not strange. Largely because of the political upheavals through which it has passed, historical sources about ancient Bohemia happen to be small in number. Those accounts that do exist lack any information about industrial history, which is understandable because they were written by clergymen and noblemen, not by artisans. The ancient artisans did not write chronicles; they were busy making good Bohemian glass.

Makowsky was not alone in his contention. Almost half a century before, a man named Martin Pokorný had made the same guess and used very similar arguments. Since there was no good natural explanation for the moldavites, the alternative, that they were artificial, was accepted.

But there were two sides to the story. If they were artificial, pieces of moldavite did not belong in a museum of natural history, side by side with samples of obsidian and other volcanic products. The curators of the museums got busy; they removed samples of moldavite before some newspaperman who might have happened to have read Makowsky's treatise could make fun of them. Obviously, the artificial moldavites belonged in industrial collections, and they should be placed next to complete products of those old Bohemian glassmakers. Since the ancient artisans had left so many pieces lying around they must have produced a great deal of glassware. Surely, then, there must be bowls, or cups, or vases of just that type of glass in collections of old glassware.

In spite of the large production indicated by the extent of the slag found, no complete or even chipped and broken pieces seemed to have survived. No bowl, or cup, or vase of moldavite could be discovered anywhere. It was strange that all products fashioned from moldavite should have been broken in the course of time, particularly since green Bohemian glass did not break easily. In fact the manufacture of Bohemian glass must have been a special trade secret since moldavite was a truly unique kind of glass. No other glassmakers ever produced glass like moldavite; just as no other volcanoes had produced the kind of obsidian found in Bohemia—if one thought back to those days when people still believed that moldavite might be volcanic in origin.

Once more the facts did not support the theory, and even Makowsky's ingenious and promising arguments proved to be merely another blind alley. That there was no record of the ancient industry was just barely possible, even though most improbable in view of its extent. It was also possible for the old Bohemian glassmakers to guard their trade secrets so jealously that no other artisans, living or dead, could produce their

peculiar type of glass. But that nothing but slag and refuse remained of a widely practical ancient industry was beyond reason.

One had to accept some explanation of the origin of the moldavites. They were either natural or artificial; there was no third choice. But after reading all the arguments on both sides of the question, one was forced to conclude that they could be neither natural nor artificial. Such a conclusion obviously was nonsense.

Then, in 1898, a really great geologist, Eduard Suess, surveyed the whole question, went over all known facts, relevant and otherwise, and found a way out. The inexplicable moldavites lost their mysteries if one assumed a natural origin for them — *but not on earth!* In other words, their distribution and characteristics could be explained if one took them to be of meteoric origin.

Much of Suess's argument was based on the fact that the green shards were no longer a specifically Bohemian phenomenon. Samples of "glass," like the Bohemian variety, had been found in the Swedish district of Skåne or Schonen. Following the example of naming the shards after the geographical region in which they were found, the Swedish samples were called "schonites." Chemical analysis proved that schonites were the same as moldavites, both being glass of rather high melting point with more aluminum and less calcium than is customary. There was no extinct volcano to account for them in Sweden and the history of the Swedish glass industries was clear, too. By the end of the Nineteenth Century there were also numberless australites in collections, most of which had been dug up in the Australian gold fields following the discovery of gold in Australia on February 12, 1851. The australites showed the influence of heat much better and more clearly than even the most typical moldavites. Some of them had a pronounced mushroom shape; a few looked like dumbbells, or rather, hourglasses. In a few rare cases they were almost perfect glass spheres, two to three inches in diameter with a wall thickness of less than a quarter of an inch! Suess reminded his readers that Charles Darwin had described a "volcanic bomb" of "obsidian" in 1844 and that Darwin himself had emphasized that the spot where that "bomb" had been found on the Australian mainland was hundreds of miles from any active or extinct volcano which possibly could have produced it.

And if the moldavites were scattered over an area a hundred miles long, the australites were scattered over thousands of miles, their distribution reaching south to Tasmania. The man who knew the australites best, a certain Alfred W. Stelzner, was satisfied that no chemical difference existed between australites and moldavites. Stelzner was also satisfied that their shapes could be explained only by assuming that they had traveled through the air at high speed in a molten or semimolten condition. Having gone that far, Stelzner naturally thought of the possibility that australites might be of meteoric origin but felt that this was an unnecessary hypothesis. Volcanoes could have thrown molten materials through the air with high speed, and

(Continued on page 358)

THE INSTITUTE GAZETTE

PREPARED IN COLLABORATION WITH THE TECHNOLOGY NEWS SERVICE

To Public Service

BEFORE retiring from President Truman's cabinet, one of the last official acts of James Forrestal, Secretary of Defense, was the naming of Professor Philip M. Morse, of the Physics Department at the Institute, to serve as research director and deputy director of the Weapons Evaluation Group of the National Military Establishment. Professor Morse will be the chief scientific authority in the agency whose primary duty will be to conduct operational research for the Joint Chiefs of Staff and also for the Secretary of Defense, on leave of absence from M.I.T.

The group which Professor Morse will head is now being formed with the assistance of the Research and Development Board of the National Military Establishment headed by Dr. Karl T. Compton. After organization it will report to the joint chiefs of staff and the secretary of defense.

During World War II, Professor Morse headed a group of scientists engaged in operational research. His outstanding ability in this line of analysis, which is summarized in his article "Of Men and Machines" in the November, 1946, issue of *The Review*, was signaled by the award of the Medal for Merit and is largely responsible for his present appointment. After the end of the war, Dr. Morse was one of the originators of, and first director of, the Atomic Energy Commission's Brookhaven National Laboratory at Upton, Long Island, operated by Associated Universities, Inc.

Council Miscellany

C. GEORGE DANDROW, '22, Alumni President, presided at the 267th meeting of the Alumni Council on February 28 when 108 members and guests were present at the Campus Room in the Graduate House. During the usual order of business, Daniel G. Hulett, '42, Secretary-Treasurer of The M.I.T. Club of the Kanawha Valley, was introduced as one of the leaders in starting that club three years ago.

Six Faculty and staff members were reported as having visited 13 Technology clubs between February 8 and 28, from Springfield, Mass., to Monterrey.

Looking toward the 1949 Alumni Day on June 11, it was reported that the Executive Committee had appointed a Committee on Alumni Day Planning to consist of Horatio L. Bond, '23, chairman, James Donovan, '28, and Malcolm G. Kispert, '44. Elected at this meeting of the Council were the following committee personnel in charge of Alumni Day, 1949:

Banquet: Robert L. Johnson, '38, chairman, George Warren Smith, '26, James B. Smith, '32, and Rutherford Harris, '37; *Class Day:* John A. Hrones, '34, chairman, Eugene Mirabelli, '19, and Kenneth R. Wadleigh, '43; *Exhibits:* William H. Brown, '33, chairman, Ernest P. Neumann, '38, Frederic W. Watriss, '41, Robert V. Bartz, '44, and Gyorgy Kepes, Staff; *Ladies' Program:* Mrs. B. Alden Thresher, chairman, Mrs. Horatio L. Bond, Mrs. Karl T. Compton, Mrs. Marshall B. Dalton, Mrs. C. George Dandrow, Mrs. Ar-

Class Reunions

The secretaries of the following classes have announced reunion plans and get-togethers to be held in 1949 as noted below:

- 1894 June 10 and 11. 55th reunion celebration. June 10, at a nearby suburban country club; June 11, at M.I.T. Alumni Day activities. Details in class letter.
- 1899 June 9 and 10, tentative dates. 50th reunion celebration. Time and place yet to be determined.
- 1904 June 24-26, East Bay Lodge, Osterville, Mass. Carle R. Hayward and Eugene H. Russell, Jr. in charge of plans.
- 1909 June 17-19 week end. Friday afternoon through Sunday. 40th reunion. East Bay Lodge, Osterville. Accommodations available for anyone who wishes to come earlier or stay later. Reunion Committee: James H. Critchett, Chester L. Dawes, George A. Haynes, Arthur L. Shaw, Henry K. Spencer, Paul M. Wiswall. See March Review, page x.
- 1914 June 17-19, Sheldon House, Pine Orchard, Conn. Reunion chairman, Charles P. Fiske.
- 1919 June 24-26, Norwich Inn, Norwich, Conn. Reunion Committee chairman, Wilfred O. Langille, Diehl Manufacturing Company, Somerville, N.J.

- 1924 June 8-11, East Bay Lodge, Osterville. George E. Parker, reunion chairman.
- 1929 June 12-14, Sunday afternoon to Tuesday morning. East Bay Lodge, Osterville. John J. Wilson, Jr., chairman, 255 Beacon Street, Apartment 54, Boston 16. See March Review, page xx.
- 1934 June 9-11, Ye Castle Inn, Cohen Field Point, Saybrook, Conn. Informal supper, June 9; class banquet, June 10; program ends after breakfast, June 11.
- 1939 June 17 and 18, Mayflower Hotel, Plymouth. Frederick B. Grant, 22 Edmunds Road, Wellesley Hills 82, Mass., in charge of plans.
- 1944-2 June 10, Campus Room, Graduate House, M.I.T., Cambridge. Plans for a dinner and entertainment are being formulated. Malcolm G. Kispert in charge.
- 1944-10 June 10, tentative date. Dinner at Hotel Sheraton, Boston. James B. Angell, M.I.T. Graduate House, in charge of plans.

If you are interested in M.I.T. class reunion plans, please consult your individual class secretary for additional information which may be available at a later date.

thur L. Hamilton, Mrs. Robert L. Johnson, Mrs. Henry B. Kane, Mrs. James R. Killian, Jr., and Mrs. William J. Kirk; *Luncheon*: William J. Kirk, '28, chairman, Frederick H. Kienle, '27, Rudolf S. Slayter, '28, and Ariel A. Thomas, '36; *Publicity*: James Donovan, '28, chairman, Henry B. Kane, '24, Beverly Dudley, '35, Kenneth S. Brock, '48, and John J. Rowlands, Staff; *Reception*: Malcolm G. Kispert, '44, chairman, William H. Carlisle, Jr., '28, and Henry Loomis, Staff; *Registration*: Wolcott A. Hokanson, chairman, G. Edward Nealand, '32, and Robert E. Hewes, '43; *Transportation*: Emmons J. Whitcomb, '11, chairman, Malcolm S. Stevens, '34, and John L. Danforth, '40; *Ways and Means*: Delbert L. Rhind, Staff, chairman, Carl M. F. Peterson, '29, and Donald Whiston, '32.

Malcolm G. Kispert, Administrative Assistant to the President, acquainted the Council members with budget matters under consideration, and gave figures showing the growth of Institute personnel, services, and finances during the past decade. In addition, he spoke of some of the Federal legislation under consideration which, if passed, would affect collegiate housing, the National Science Foundation, and the Universal Military Training program.

John E. Burchard, '23, Dean of Humanities, next presented the history of the convocation and inauguration program to take place in Cambridge from March 31 to April 2, and enumerated the speakers who would participate, as recorded in the March issue of *The Review*. He also presented a résumé of the problems which have come about as a result of the very great interest on the part of Alumni and friends of M.I.T. to attend the convocation and inauguration, and hinted (as has been subsequently confirmed) that only the Boston Garden would be large enough to accommodate those who planned to attend.

Warren K. Lewis, '05, Emeritus Professor of Chemical Engineering, then introduced the speaker of the

evening, Glenn C. Williams, '42, Associate Professor of Chemical Engineering, who spoke on jet propulsion. Professor Williams presented an able historical summary of progress in this field and outlined the several types of jet-propelled missiles which have been investigated. He elaborated his lecture by indicating the relative efficiencies, velocities, and fuel consumptions of the different types, including the ramjet which had been developed at Technology and had been the first one tested in flight in the United States.

Economics of Housing

THE Merrill Foundation for the Advancement of Financial Knowledge recently has made available to M.I.T. a grant of \$50,000 for a research program on the economics of the housing industry. Winthrop H. Smith, President of the Foundation and managing partner of Merrill Lynch, Pierce, Fenner and Beane, announced that the study would be carried on in the Department of Economics and Social Science at M.I.T. under the direction of Professor W. Rupert Maclaurin and a staff of experts.

The program, which will form the basis for the study by Professor Maclaurin and his associates, includes investigation of such factors as unit operations, building codes and zoning restrictions, building trades' union practices, the relation of component manufacturers to the building industry, site developments, and the attitude of home owners toward the practice of standardization.

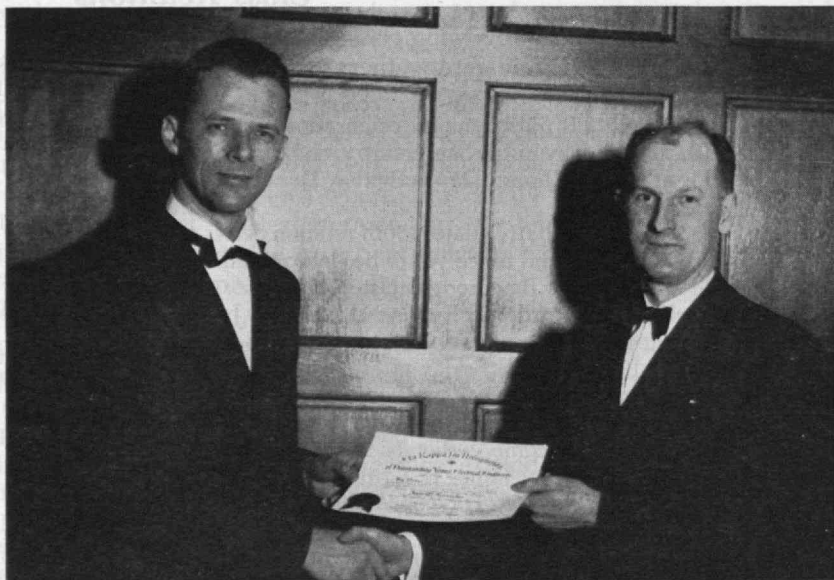
Professor Maclaurin said that the studies will be focused on what has been done and what can be done operationally to overcome the various handicaps which have retarded the advancement of the industry, and it is hoped that the study will result in measures to bring order and stability to the housing industry. It is expected that a number of leading concerns

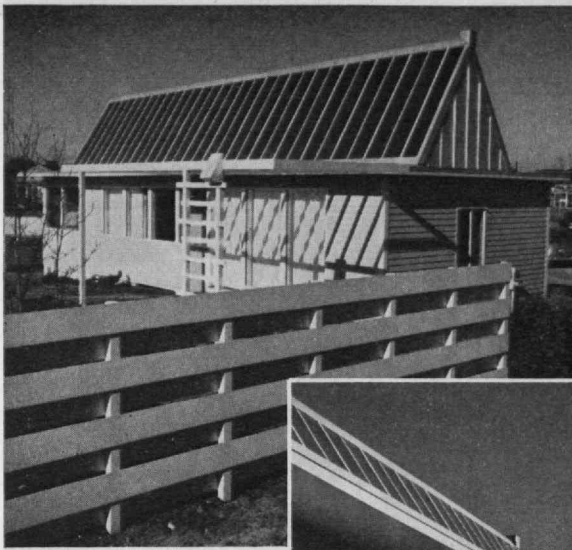
Honored for Electrical Engineering

Jay Wright Forrester, 6-45, Associate Director of the Servomechanisms Laboratory, received one of the two honorable mentions in the selection of the outstanding young electrical engineer of 1948 by the Jury of Award of Eta Kappa Nu, national honor society for electrical engineers. He is shown here receiving the award certificate from T. W. Williams, President of Eta Kappa Nu.

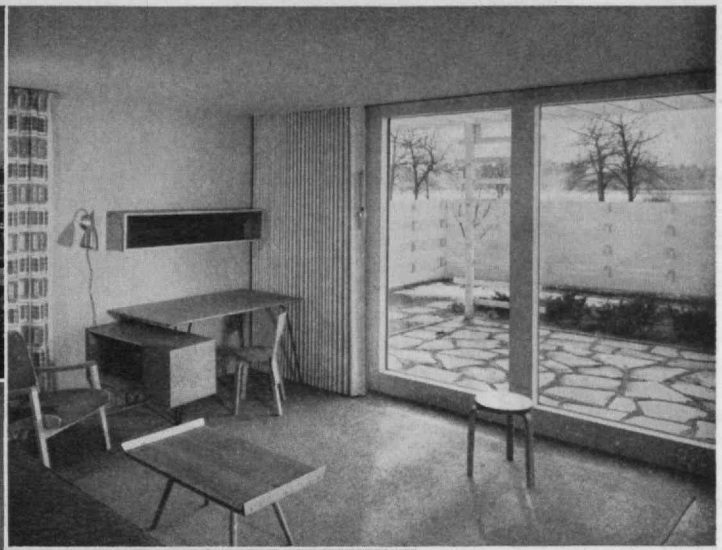
The Eta Kappa Nu Recognition Award is made annually "for meritorious service in the interest of their fellow men" on the part of young electrical engineers, not only for their technical ability and accomplishments already achieved, but also for their interest in cultural and civic advancement and their promise for future development. To qualify for the award, candidates must not be older than 35 years, nor be out of college more than 10 years by May 1 of the year for which cited.

Following graduation from the University of Nebraska in 1939, Mr. Forrester came to the Department of Electrical Engineering at M.I.T. as a graduate student and research assistant on the development of high-voltage electrostatic generators in the few-megavolt range and the application of these generators to the treatment of cancer. He also participated in the instruction of undergraduates. In 1940, he was assigned to a small group of research workers to develop servomechanisms for gunfire control, and he helped develop an hydraulic type subsequently used extensively on the antiaircraft weapons of both the United States Army and the Navy. Mr. Forrester's major technical contributions have come in the past three years while working in the field of digital computers.





Three views of the recently completed dwelling for research on solar energy for home use. The exterior views show the solar-energy collecting unit on the roof, which heats water in a 1,200-gallon tank located above the living quarters and adjacent to the panels which form part of the roof.



Maximum advantage is taken of all sunlight, as shown by the full-length windows in the living room (above), the large windows (left) of other rooms of this dwelling, and the southerly exposure. The house is occupied by an M.I.T. student while research aims to determine feasibility of solar heating.

M.I.T. Photos

in the building industry will co-operate in the study in order that all aspects of the problems of the industry may be thoroughly understood.

For Wintry Weather

THE sun is substituting for a furnace in New England's newest home, a four-room "solar" house recently erected on M.I.T. property on Memorial Drive, set aside for student housing. Opened to use during February, the unusual house will be occupied by a student family while M.I.T. engineers study the efficiency of their latest design for using radiation from the sun to warm the house throughout the winter.

According to Professor Hoyt C. Hottel, '24, of the M.I.T. Department of Chemical Engineering, the house will be used for studies to determine the extent to which the sun can compete with conventional methods of heating. It is not now presumed that solar heating will be economically feasible in a climate as cold as that of New England, but the results of studies now in progress should serve to indicate conditions of climate for which solar heating is competitive with fuel oil, gas, or coal.

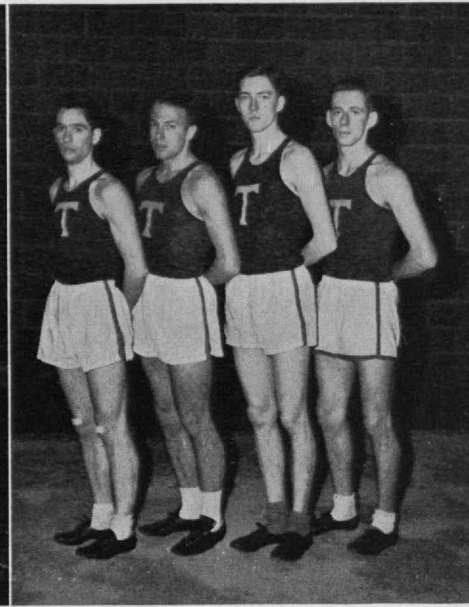
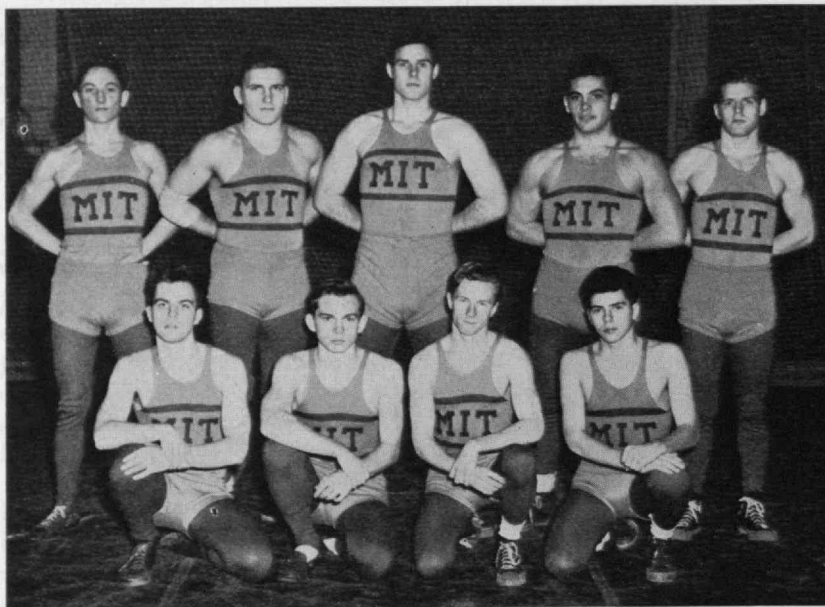
The new M.I.T. solar house has the appearance of a typical modern residence, except for its heat collector in the roof. It has two bedrooms, a kitchen, a living-dining room, and an instrument room in which the heat absorbed from the sun and that lost from the house during sunless hours will be continuously recorded by the instruments.

The heat-storing equipment is designed to keep the house at 68 degrees F., night and day, but supplement-

tary electric heating units have been provided for long periods of sunless days during cold weather. Electric auxiliary heating, which will go into operation should the house temperature drop to 65 degrees, was chosen primarily because of convenience in experimental work of this type.

Water, warmed by the sun in a flat-plate collector located on the roof of the house, is used for storing and distributing heat. Once warmed by the sun, the water is pumped into an insulated tank in which it is held for use during sunless hours, when the house is warmed by the heat radiated from a panel in the ceiling. The storage tank holds 1,200 gallons of water. During an average January day, the temperature should rise a few degrees more than it falls at night, thereby slowly storing heat energy for use on sunless days. Present calculations indicate that this water should have sufficient heat capacity to maintain comfortable temperatures in the house for two sunless days of normal January weather. It is expected that not too much dependence will have to be placed on the auxiliary heating unit, for from a solar engineer's point of view, a truly sunless day is unusual in New England; even through light clouds, considerable solar heat is received.

The heat collector unit on the roof of the house is adapted from a unit studied in M.I.T.'s prewar solar heating research program. It slopes 57 degrees to the horizontal, faces south, and presents a net area of 400 square feet on which the sun's heat is received. The roof of the house is covered with aluminum, so that additional solar energy will reach the collector by reflection from the roof. In addition, a large window on



M.I.T. Photo

M.I.T. can boast of two outstanding sports accomplishments this past winter season. Freshman wrestlers are proud of two wins over Harvard, generally considered the best among the local grapplers, and also wins over Tufts, Springfield, and Wesleyan. The team consists of (front row, left to right): Samuel L. Mitchell, Donald P. Brown, Lawrence J. Foley, Lawrence W. Mayer; (back row) Francis M. Frasher, Jr., Charles E. Bading, Robert J. Robertson, Eugene J. Rapperport, and Hugh Robertson — all of the Class of 1952. Technology's varsity track team set a new M.I.T. mile-relay record of 3:22.6 at the Millrose Meet in New York's Madison Square Garden on January 29, 1949. Four members of this team are (left to right): Alphonse J. Dell Isola, '50, Edward S. Olney, '51, Randall K. Cleworth, '49, and H. Douglas Vitagliano, '49.

the south side of the house, opening into the living room, will collect additional heat during sunlight hours.

The collection and heating unit is a compact, closed-cycle system at atmospheric pressure; no outside air or water is introduced once operation is begun. The parts of the unit include the roof collectors, an attic storage tank, a radiant ceiling panel heating unit, two circulating pumps, and controls. Whenever the sun heats the water in the roof collectors to a temperature above that of the storage tank, a pump circulates the water from tank to roof collectors and back. Whenever the temperature of collector water is below that in the storage tank, the flow of water is cut off and the collector is pumped full of air to prevent freezing damage. Quite independently of this circulating system, whenever the room thermostat calls for heat, a second pump circulates water between the storage tank and the radiant ceiling panel.

The solar house is carefully insulated to reduce heat loss to a minimum. Windows have double panes of glass with air space between, and inside curtains will be drawn over them after dark to provide further insulation. The walls are insulated with four-inch pads of rock wool, Celotex, and aluminum foil. Despite the essentially research nature of the project, considerable effort has also been spent to make the house as attractive and comfortable a dwelling unit for student use as possible.

Designers of the new M.I.T. house decline to estimate the cost of a solar heating system for the average New England house (or even to say that such a system can be effective in as severe a climate as that of New England). The present design does not include expensive oversize equipment to provide capacity for extreme cold spells or sunless periods of a week or more.

Instead, auxiliary electric equipment is provided to heat the water in the radiant ceiling panel under these circumstances. Hot water for domestic use in the solar house is heated independently by a conventional electric unit.

The instrument room in the house contains automatic recording equipment to measure the intensity of solar radiation, the amount of heat energy received from the sun, the amount supplied in the house by electric means, the temperature of the storage water, and the air temperature at various points in the house.

Since normal family activities will be proceeding in the solar house while tests are being made, M.I.T. scientists hope their automatic instruments will provide figures for heat loss and heat storage requirements under typical dwelling conditions, from which it may eventually be possible to estimate fuel savings and arrive at a practical figure for the over-all costs of solar heating.

The house, part of an M.I.T. program of research into means of utilizing solar energy, was built with funds provided in a grant to the Institute by Godfrey L. Cabot, '81, of Boston. The solar energy work is under the supervision of a steering committee consisting of Professor Lawrence B. Anderson, '30, Head of the School of Architecture; Albert G. H. Dietz, '32, Associate Professor of Structural Engineering, Department of Building Engineering and Construction; August L. Hesselschwerdt, Jr., '31, Assistant Professor, Department of Mechanical Engineering; and Professor Hottel. The construction of the house and the research directly associated with it are directed by Edmund L. Czapek, research associate in the School of Architecture. The architectural design is the work of J. Franklin Haws of Pottstown, Pa., a student in architecture at M.I.T.

BUSINESS IN MOTION

To our Colleagues in American Business . . .

The device you see pictured here is an automobile light switch which controls parking and driving lights. Probably few motorists have ever seen such a switch, because the body of it is concealed under the dash or back of the instrument panel. People see only the knob. Because the operation of such a switch is so simple and reliable, probably most people think it is equally simple in design.

The fact is, however, that its simplicity and reliability of operation are protected by design and materials that foresee the conditions and contingencies of use. This is typical of a great many products which are taken for granted by people who never realize how much forethought has been given to the creation of hidden values that assure satisfaction.

Take the matter of selection of materials. The switch uses steel in several types and forms, brass, phosphor bronze, silver, canvas base bakelite, a felt washer to exclude dust, a plastic, and if you include the fuse, lead and glass. All told, there are some 20 main parts. Of these, four are made of Revere phosphor bronze, used for contacts, contactor, and rivets, these being the parts in which the special qualities of phosphor bronze are essential.

The fact that the use of Revere phosphor bronze is confined to four small parts illustrates a basic Revere policy, which is that we recommend Revere

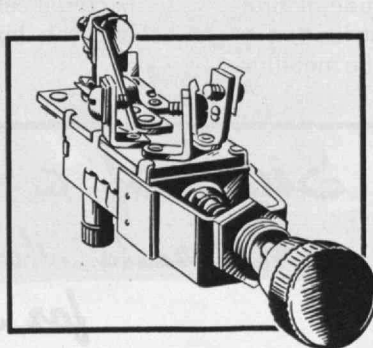
Metals only for the purposes for which they are better suited. If we were asked if we would recommend brass for the bracket and case, we would say that the steel being used is perfectly suitable, should last as long as the car, and has a minimum cost.

We like to sell Revere Metals, but not to our customers' disadvantage. Our Technical Advisors are in constant consultation with manufacturers and do not hesitate to suggest whatever material will enhance performance or save money. Recently, for example,

one of these engineers found a customer using a phosphor bronze for a cover plate, and remarked that a certain nickel silver would serve as well and cost somewhat less, since it would have adequate springiness, strength, and corrosion resistance in that application. On the other hand, substitution of phosphor bronze for nickel silver has been recommended from time to time. It all depends upon the needs of the specific application.

This attitude of Revere's is by no means unique; it is to be found throughout American industry. The one essential to make it resultful is that the supplier be taken as far as possible into the manufacturer's confidence, because only then can the supplier's knowledge be made available.

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THE TREND OF AFFAIRS

(Continued from page 326)

field, being a new application, required a much more streamlined setup. Admittedly, such a diversity of organizational setups must have been quite a headache to the top administration. Yet the success of each of these divisions is a tribute to the judgment which permitted such flexible operations.

In retrospect, it is possible to interpret the net effect of the book into the following generalizations:

(1) The NDRC was able to perform research and development on a large class of scientific and technical devices which the services, by their rigid organization, were not in a good position to pursue;

(2) A fairly large fraction of the scientific effort of the United States went into the development of specific technical problems and measuring instruments whose integration into the over-all war effort was not clearly evaluated from the standpoint of national urgency. In this last connection the reader is permitted to ask the question whether the man power could not have been better used if it had been organized into large central research laboratories.

The chief criticism of the book as a whole is that it has not separated out of the large multitude of projects those which made a significant contribution to the war effort. This is particularly true in the metallur-

gical section which merely lists each project and leaves the evaluation entirely to the reader. On the whole, the book is a tribute to the co-operation of the large number of individuals and companies in pooling their information for the benefit of the nation. The book will undoubtedly serve as a valuable source of material for future historians. — I.A.G.

Raw Deal

THE anatomist says that man differs from his nearest relatives in the animal kingdom by possessing an opposable thumb; the philosopher differentiates man from the lower animals by the human ability to transmit ideas through spoken and written language. But an equally valid, if prosaic, point of differentiation is the fact that man is the only animal that cooks most of his food. Three reasons might be advanced for this custom: sanitation, nutrition, and flavor. But when such possible motives are examined, it is clear that only flavor is a governing influence.

Cooking, it is true, does promote the sanitary quality of foods, because cooking heat destroys important micro-organisms, toxins, and parasites. All of the microbes that cause intestinal disease are killed by ordinary cooking temperatures. There are two important food-poisoning toxins (nonliving poisons excreted by bacteria that act independently of the presence of the bacterial cell): one, the toxin of botulism, is destroyed by heat; but the other, the toxin of Staphylococcus

(Continued on page 344)



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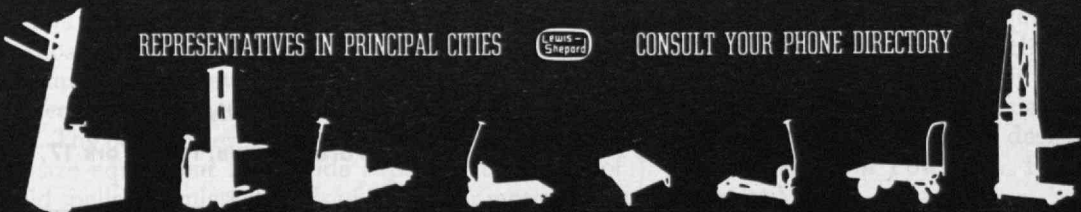
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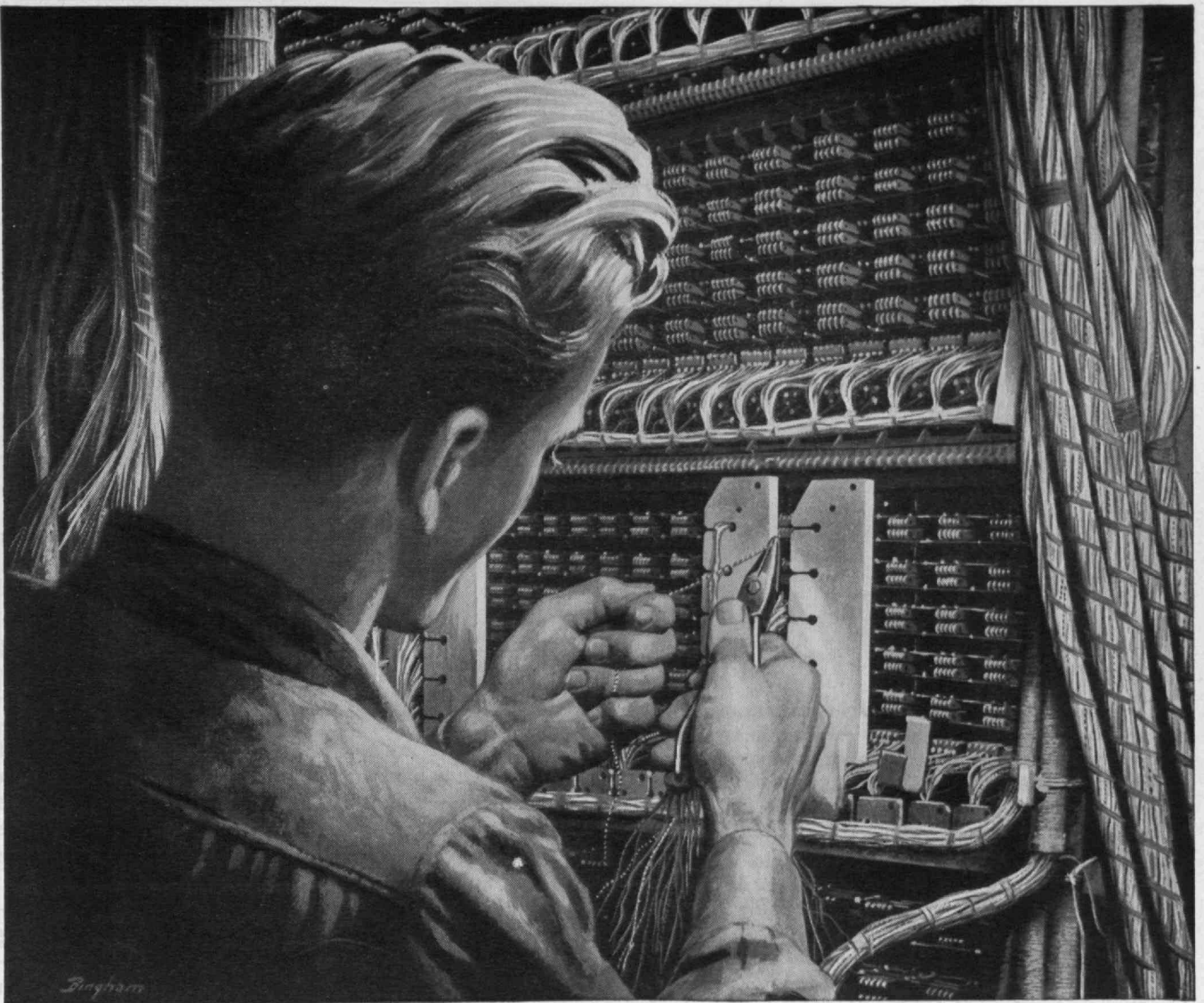
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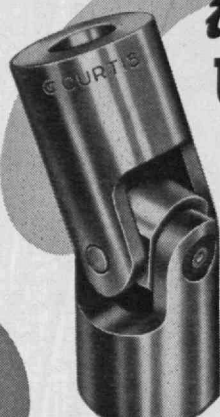


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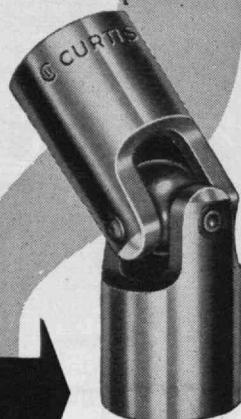
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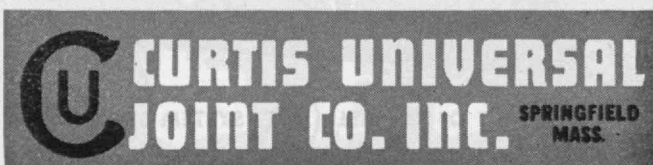
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C-644	Std.	$\frac{3}{4}$ "	$2\frac{11}{16}$ "	1300	2800
CS-44	Ball	$\frac{3}{4}$ "	$2\frac{11}{16}$ "	650	2000
C-646	Std.	1"	$3\frac{3}{8}$ "	2500	5150
CS-46	Ball	1"	$3\frac{3}{8}$ "	1250	3600
C-648	Std.	$1\frac{1}{4}$ "	$3\frac{3}{4}$ "	5000	7200
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All Curtis Joints can be furnished with hubs machined to your specifications. Drawings should accompany inquiry if possible.

For complete engineering data and drafting templates write Dept. B-5.



THE TREND OF AFFAIRS

(Continued from page 342)

food poisoning, survives prolonged boiling. The parasites associated with foods are mainly worms that infest the intestinal tract. And it is only in this latter category that cooking is truly the primary means of making a food sanitary. The trichina parasites that may occur in pork, and that infest the human body when meat containing them is eaten, are destroyed when sufficient heat is used to cook the pork. Furthermore, thorough cooking of pork is the only entirely reliable means of preventing human trichinosis. In contrast, most other foods are kept sanitary much better by protection from infection or infestation while they are being grown or raised, harvested, processed, packed, and distributed.

The nutritive values of foods are in some respects improved, and, in some respects, worsened by cooking. Certain foods are made more rapidly or more completely digestible by cooking. But we are not concerned here with indigestibility in the sense of causing dyspepsia; the change in digestibility produced by cooking is a relatively small shift in rate or completeness of digestion, that can be measured by the physiologist but is not appreciated by the consumer. Cooked soya beans have higher protein value than raw soya beans. Raw clams interfere with effectiveness of the vitamin thiamine,* and raw egg white neutralizes the vitamin biotin. When cooked, both of these foods lose their antivitamin effects.

So much for random examples of the beneficial effects of cooking. On the detrimental side, cooking sometimes destroys portions of heat-sensitive nutrients, such as certain vitamins and amino acids. Even more important than destruction by heat are losses, by leaching, of water-soluble nutrients when water is used for cooking and then discarded. The high temperatures used in making puffed or exploded prepared breakfast cereals have been shown to reduce protein values. Nevertheless, most of the nutritional effects of cooking, both favorable and adverse, are of limited practical significance in a liberal, well-chosen dietary. In any event, it must be granted that nutritional considerations, like those of sanitation, rarely if ever motivate human beings to cook their food.

Legend holds that cooking originated when a pigsty burned and killed its tenants, whereupon the owner blundered upon the discovery that the roasted animals had a novel and delightful flavor. Although patently apocryphal, this tale is rooted in the fact that man's basic reason for cooking his food is production of tastes, flavors, textures, and other gustatory properties he has come to prefer. Thus the cereal grains, which constitute a major part of the human dietary throughout the world, are virtually inedible by the human being unless they are cooked, as in the boiling of rice and the baking of wheaten foods. Potatoes, another staple food, are extremely cloying to the human palate when raw. Other vegetables, such as car-

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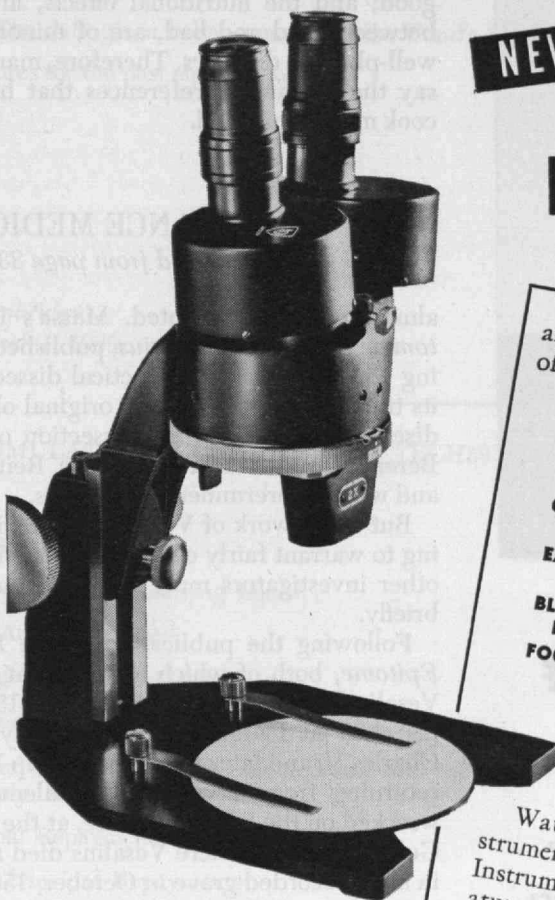
* The Technology Review, June, 1946, page 480.

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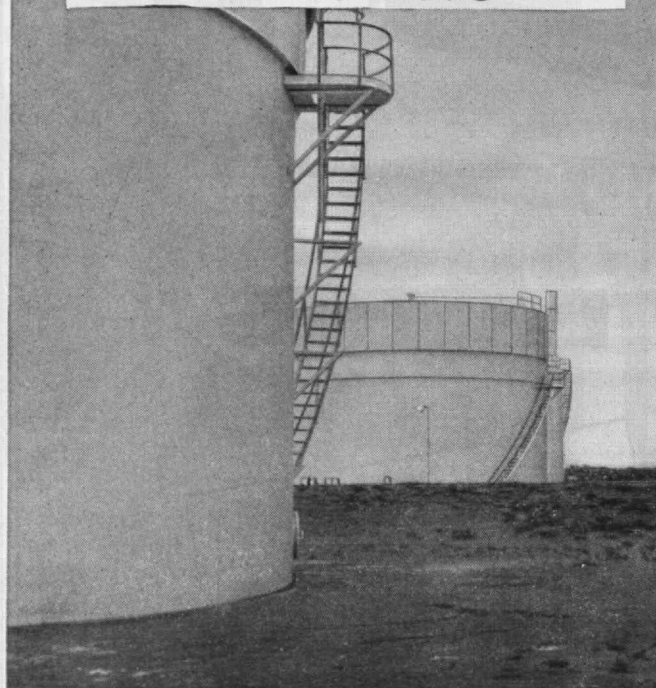
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THE TREND OF AFFAIRS (Concluded from page 344)

rots or cabbage, are eaten either raw or cooked, but they must be shredded, grated, or otherwise altered in physical state to be generally acceptable when uncooked. Raw eggs are usually distasteful to human beings unless disguised in an eggnog. Some nuts are unpalatable when raw. Fish is practically never eaten uncooked; meat only in the form of the "tartar steak."

Thus, the sanitary effects of cooking are all to the good; and the nutritional effects, although divided between good and bad, are of minor significance in well-planned dietaries. Therefore, man need not gain-say the gustatory preferences that have led him to cook most of his food.

RENAISSANCE MEDICINE (Continued from page 334)

almost certainly indebted. Massa's illustrated *Anatomiae Liber Introductorius*, published in Venice during 1536, was the best practical dissecting manual of its time. It was replete with original observations and discoveries based on the dissection of many bodies. Berengar and Massa were true Renaissance spirits and worthy forerunners of Vesalius.

But if the work of Vesalius is sufficiently outstanding to warrant fairly extended discussion, the work of other investigators must also be mentioned, even if briefly.

Following the publication of the *Fabrica* and its *Epitome*, both of which appeared at the same time, Vesalius' work was completed.† In 1546 he resigned his chair at Padua and became physician—first to Charles V, and later to his son, Philip II, of Spain. On returning from a visit to Jerusalem, his ship was wrecked on the Island of Zante, at the entrance to the Gulf of Corinth. There Vesalius died and was buried in an unrecorded grave in October, 1564.

Vesalius was succeeded at Padua by Realdus Columbus of Cremona (1516–1559). In 1559 Columbus published a work entitled *De Re Anatomica* in which he dealt with the lesser or pulmonary circulation. This account is almost in the words of Vesalius' fellow student, Michael Servetus (1511–1553), who had first described pulmonary circulation in a theological work *Christianismi Restitutio* at Vienne in 1553, the year of his martyrdom.⁵

The anatomist who succeeded Columbus in the chair of anatomy at Padua in 1551 was Gabriel Fallopius of Modena (1523–1562). As an anatomist Fallopius proved himself almost as distinguished as Vesalius. His *Observationes Anatomicae*, published in 1561, contains numerous original observations and

(Continued on page 348)

† It is good to be able to say that, after 400 years, a translation into English of the *Fabrica* has been completed (by Professors John B. deC. M. Saunders and Charles D. O'Malley) so that Vesalius' extraordinary book may soon be read by those of us whose Latin is not equal to the task.

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The data given below summarize the Fund's transactions during 1948 together with cumulative figures for the past eighteen years.

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March 1, 1949

CUMULATIVE RECORD OF THE TECHNOLOGY LOAN FUND TO December 31, 1948

	At Dec. 31, 1948	At Dec. 31, 1947	Net changes during 1948
ITEMS OF OUTGO			
Number of men Receiving Loans	2,791	2,708	up 83
Total Amount Loaned	\$2,011,963	\$1,956,190	up \$55,773
Average Per Capita Loan	721	722	down 1
ITEMS OF INCOME			
Number of Men Whose Indebtedness has been Completely Discharged	2,098	2,015	up 83
Principal Repayments in Advance	\$ 569,224	\$ 558,649	up \$10,575
Other Principal Repayments	1,081,444	1,032,494	up 48,950
Total Principal Repayments	<u>\$1,650,668</u>	<u>\$1,591,143</u>	<u>up \$59,525</u>
Total Principal Matured, Considering "Advance Repayments" as Matured When Paid	\$1,683,121	\$1,623,724	up \$59,397
Collection Ratio, i.e. Percentage of Total Maturities Paid	98.0	97.9	up .1
Matured Principal in Arrears	\$ 25,335	\$ 26,613	down \$1,278
Actual "Written Off" Accounts	7,118	5,968	up 1,150
Total Maturities Unpaid	\$ 32,453	\$ 32,581	down \$ 128
Percentage "Written Off" to Total Loans	0.3	0.3	—
Percentage Matured Loans in Arrears plus Amount Written off to Total Loans	1.61	1.66	down 0.05
Interest Received	\$ 222,958	\$ 215,836	up \$7,122
Times Interest Received to Matured Loans in Arrears Plus Amount "Written Off"	6.9	6.6	up 0.3
NOTES OUTSTANDING	\$ 354,176	\$ 359,079	down \$4,903

RENAISSANCE MEDICINE

(Continued from page 346)

discoveries, and a fair amount of respectfully expressed criticism of Vesalius.

Three years after his death, Fallopius was succeeded at Padua in 1565 by his pupil, Hieronymus Fabricius of Aquapendente (1533-1619). Fabricius was a curious blend of Galenical interpreter and Vesalian methodologist and investigator. For more than 50 years he carried out observations on the embryology of the human fetus and the chick, and the anatomy and physiology of the venous circulation. By 1598 when the young Englishman, William Harvey (1578-1657), came to study with him Fabricius had discovered the valves of the veins. There is little doubt that through his lectures and demonstrations Fabricius exercised a capital influence upon the direction of Harvey's thought, and that this eventually resulted, in 1616, in Harvey's discovery of the circulation of the blood.⁶

At this period much work in embryology was being done by such men as Giulio Cesare Aranzio (1530-1589), Professor of Anatomy at Bologna. In his *De Humano Foetu Oposculum*, which appeared in 1564, many important observations were made, among which was the discovery that the maternal and fetal circulations were separate. He also gave some admirable anatomical descriptions of the fetal membranes. The Frisian, Volcher Coiter (1534-1600), made many valuable observations on the development of the chick

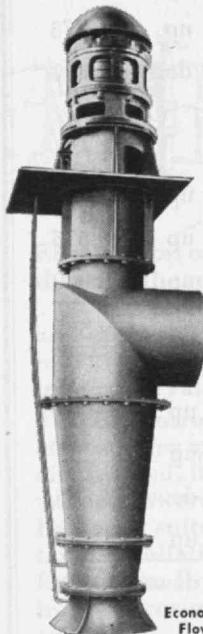
and wrote and published in 1573 an admirably illustrated comparative anatomy.⁷ Men such as Bartolomeo Eustachius (1520-1574) of Rome, Giovanni Filippo Ingrassias (1510-1580) of Naples, Costanzio Varolius (1542-1575) of Bologna at Rome, and the others already mentioned testify to the strength and dominance of the Italian school of anatomy which, as Haller remarked, taught the rest of Europe for a period of a century and a half.

The Italian school of anatomy had its most immediate effect upon surgery. Still, the outstanding surgeon of the Sixteenth Century was not a native of Italy but the Frenchman, Ambroise Paré (1517-1590). Paré was a military surgeon who, by making his own observations, brought an entirely new point of view to the treatment of gunshot wounds, which had hitherto been regarded as invariably poisonous. He eliminated the practice of treating wounds with boiling oil and instead substituted soothing applications. Further, he discarded the cautery to arrest bleeding after amputation and introduced simple ligature. Among other things he devised many new surgical instruments and invented the most ingenious artificial limbs. As the most eminent surgeon of his age, Paré, whose works were widely published and translated, raised surgery from a despised handicraft to a plane on a par with other branches of medicine.

It was during the first half of the Sixteenth Century that charters of incorporation were granted to the Guilds of Surgeons in Europe, and licenses to practice

(Continued on page 350)

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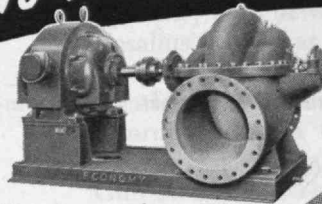


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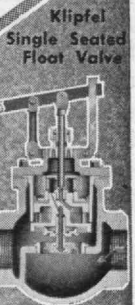
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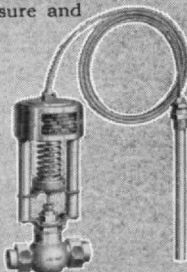
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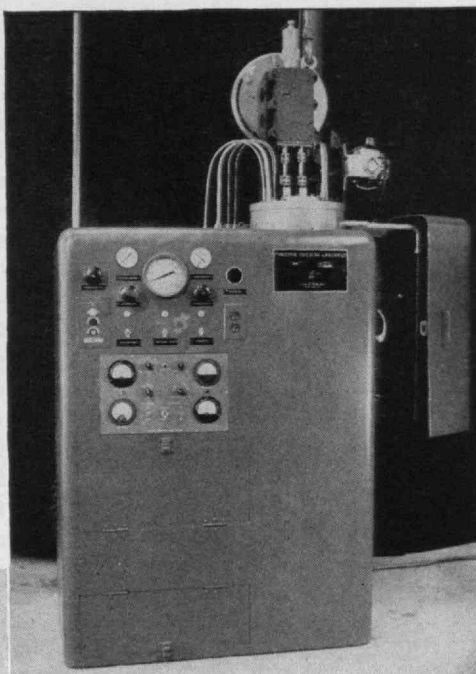
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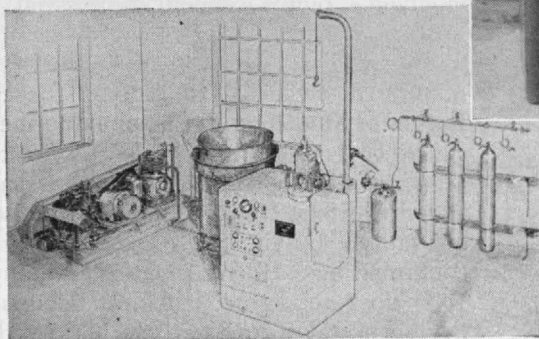
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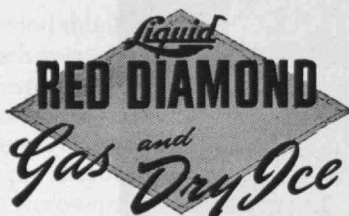
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RENAISSANCE MEDICINE

(Continued from page 348)

surgery were instituted. It was not until the latter half of the century, however, that surgeons acquired both repute and status. This was the age of itinerant lithotomists. These traveling removers-of-stones-from-the-bladder were regarded as many grades lower even than the surgeon. And yet among the lithotomists there were often men of great surgical ability and even genius, as may be illustrated by the case of Pierre Franco (1500-1561) of Provence, who like Paré had no formal training. Franco was the first to perform suprapubic lithotomy, an operation which was not again performed until John Douglas revived it in 1718. Franco invented a forceps for crushing stone, so that the fragments might pass more readily through the wound. He wrote a treatise on hernia, was first to describe the operation for strangulated hernia, and successfully performed operations for cataract.⁸

Here a few words may be in order about Theophrastus von Hohenheim (1493-1541), a great Renaissance spirit who has only in recent years come to be fairly understood. He was the subject of a long poem by Robert Browning, namely *Paracelsus*, the Latin name by which von Hohenheim called himself and by which he is generally known. As published by Karl Sudhoff, the collected works of Paracelsus run to 14 volumes⁹ and cover the entire range of medicine and surgery in manner highly original for his day. His guiding principles were observation and experiment and a truculent disrespect for all authority drawn from books. He regarded himself as the reformer, the Luther of Medicine. In the announcement to his first course of lectures at Basel in 1527 he stated that the art of medicine had decayed. "But we shall free it from its worst errors. Not by following that which those of old taught, but by our own observation of nature, confirmed by extensive practice and long experience. Who does not know that most doctors today make terrible mistakes, greatly to the harm of their patients? Who does not know that this is because they cling too anxiously to the teachings of Hippocrates, Galen, Avicenna, and others?" "If I want to prove anything," he added, "I shall not try to do it by quoting authorities, but by experiment and reasoning thereon." Such words were not calculated to endear anyone to the medical faculty, and Paracelsus soon found himself on his wanderings again. His work in chemistry, pharmacology, and general medicine exercised a considerable influence, and was an inspiration to many who came under his fermentative power.¹⁰

Obstetrics made a good beginning in 1513 with the appearance of *Der Swangern Frauen und Hebammen Rosengarten* by Eucharius Rosselin (c. 1526). Translated into many languages (including English in 1540) as the *Birth of Mankind* and frequently reprinted until the end of the Seventeenth Century, it exercised a wide influence. It was Paré who reintroduced the ancient practice of podalic version, and restored the midwife to a responsible position. Paré's son-in-law, Jacques Guillemeau (1550-1613), carried the obstetrical ideas of Paré further.¹¹

(Continued on page 352)

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RENAISSANCE MEDICINE

(Continued from page 350)

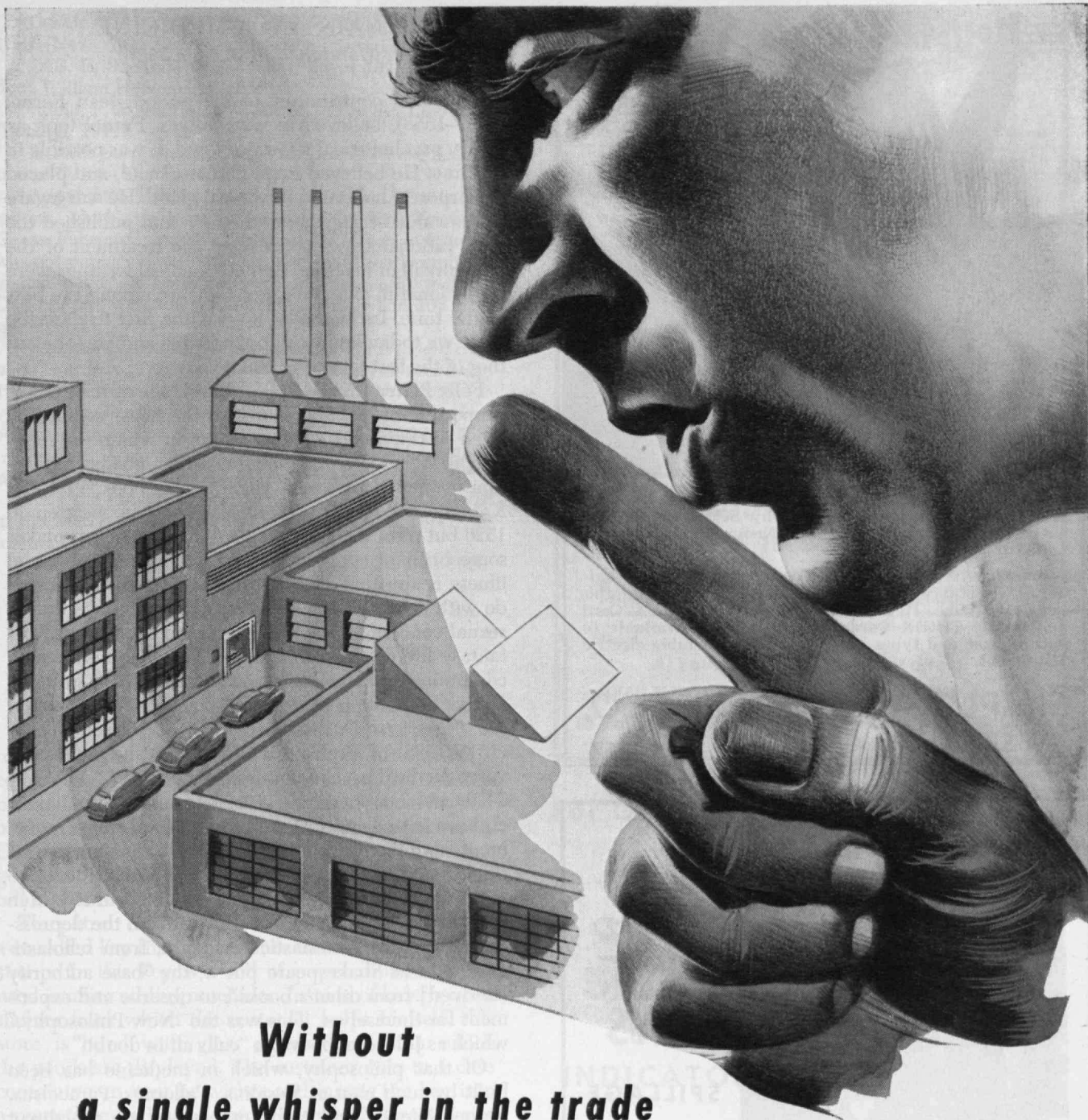
It was the Italian, Scipione Mercurio (1540–1616), who recommended Caesarian section particularly in cases of contracted pelvis. His book *La Comare o Rac-coglitrice*¹² published in 1559 went through innumerable editions well into the Eighteenth Century. It was an extraordinarily good book and in addition to its sound obstetrical teaching contained much pediatric wisdom. At a time when well-to-do women were employing wet nurses he wrote: "It is barbarous to send the child away that has been in the mother's body, under her heart, and has fed with her own blood during nine months." Which reminds us of Jacoby's remark some 50 years ago that there is more intelligence in one breast of a mother than in the combined cerebral hemispheres of all the pediatricians put together. Pediatrics during the Sixteenth Century remained on the whole medieval, there having been no original contributions in this subject in this century, to knowledge.

In bacteriology, Girolamo Fracastoro (1478–1553), who gave syphilis its name, made an outstanding contribution to a rational theory of disease in his book *De Contagionibus*, published at Venice in 1546. He regarded infection as due to the passage of minute bodies from some infected source. "Infection," he wrote, "in the ordinary sense of the word is nothing else than the passage of a putrefaction from one body to another either contiguous with it or separated from it." Fallopius and Paracelsus had held similar theories as had Peter of Abano (1250–1316) in the Thirteenth Century. It was, however, Fracastoro who came closest to a germ theory of infection. There were no significant contributions toward pathology in this century, the few works published on this subject being chiefly compilations with some of the authors' own cases added. The most useful and complete of these works was published in two volumes at Frankfurt in 1600. This was *Observationum Medicarum Rarum* by Rembert Dodoens (1517–1585).

Pharmacological knowledge was still largely irrational and based on superstition and alchemy, but a sound basis in this field was being laid by Paracelsus, the one great experimenter and contributor of the century. It was he who introduced antimony into medicine, and he was the first to employ tincture of hellebore, tincture of compound of aloes, and tincture of metal or *Lilium Paracelsi*. The latter was prepared from alloys of antimony mixed either with iron, tin, or copper, and was served as a cordial.

What we today know as neurology and psychiatry began to make its first appearance during the Sixteenth Century when a trend to correlate disease with structure first became evident. This was no inconsiderable achievement in a period when ecclesiastical authority had turned knowledge of the human mind, especially in its aberrant functioning, into a codified demonology. It is well to recall that men like Ambroise Paré believed in witches, as did the great and gentle Sir Thomas Browne, author of the *Religio Medici* in the Seventeenth Century. One of the great medical hu-

(Continued on page 354)



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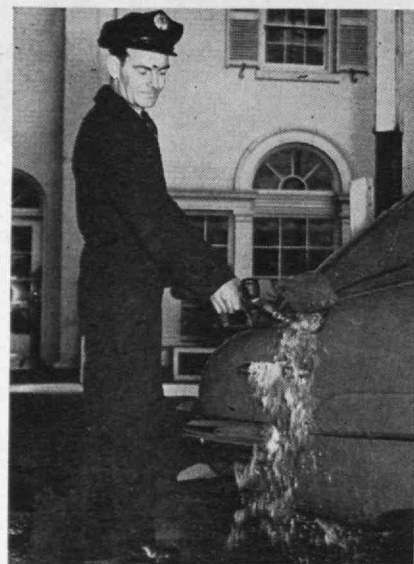
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manists and contributors of the period, Jean Fernel (1497-1558), believed in werewolves. Fernel took as nearly psychological a view of mind as was possible in his time. He believed in an immortal soul, and placed its corporeal habitat in the pineal gland. He was aware of the value of suggestion-therapy, and published the most rational views concerning the treatment of the mentally ill of his time. Fernel's medical writings were transitional in character, but they are among the best of the time. Incidentally, he was the first to describe what we today know as appendicitis, and was the author of the first text on pathology.

Félix Plater (1536-1614) of Basel, one of the earliest supporters of Vesalius, north of the Alps, voluntarily lived in the dungeons and cellars in which the mentally ill were kept, and emerged with a good classification of mental diseases. Again, in his book, *Von den Krankheiten so die Vernunft Berauben*, written in 1526 but published at Basel in 1567, Paracelsus makes some brilliant suggestions, such as that most mental illness is spiritual and has absolutely nothing to do with demons. He also states that hysteria is due to sexual conflict, and actually refers to the unconscious fantasy life of children as being associated with such conditions as chorea or hysteria. Perhaps the most effective demolition of demonology is the monumental *De Praestigiis Daemonum*, 1563, of Johann Weyer (1515-1588) of Brabant which greatly helped to divorce medical psychology from theology.

Renaissance medicine is seen as a congeries of disciplines in transition. It represents a transitional movement from the old way of believing to the new way of thinking which was to have its full-bodied development in the next, in the Seventeenth Century. Men were attempting to free themselves from the depressing tyranny of ecclesiastical thought, from scholasticism, and as Shakespeare put it, the "base authority [derived] from other's books"; to observe and experiment for themselves. This was the "New Philosophy," which as John Donne wrote "calls all in doubt."

Of that philosophy, which in medicine has been built by such men as Vesalius, Fallopius, Paracelsus, Fernel, Weyer, and many others, we are the direct benefactors. Suffering from a decay of the human spirit, we need today a revival of the spirit of the humanitarian men of the Renaissance. Today man knows more about the relation of atoms than he knows about human relations. Unless he cultivates the knowledge of human relations at least as assiduously as he pursued the quest of the atom, man will become as extinct as the dodo. It has become increasingly clear that, if civilization is to continue, scientific thought must be applied to man himself as a social creature.

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⁵ He was burned at the stake for heresy at the instigation of Calvin, October 27, 1553.

⁶ Apparently Fabricius took as his motto, *Pauca sed natura*, which was later also adopted by Karl Friedrich Gauss. Fabricius' work on the valves, *De Venarum Ostioliis*, was not published until 1603 in Venice; his early embryological works, *De Formato Foetu* and the *De Formatione Ovi, et Pulli*, were not published until 1604 and 1621, respectively.

⁷ *Externarum et Internarum Principalium Humani Corporis Partium Tabulae et Exercitationes*, Nuremberg, 1573.

⁸ See his *Traité des Hernies*, Lyon, 1561, the revised edition of an earlier work, *Petit Traité*, published in 1556.

⁹ Sudhoff, Karl, *Theophrast von Hohenheim gen. Paracelsus Sämtliche Werke*, 14 volumes, Munich, 1922-1933.

¹⁰ See the excellent essay *Paracelsus* by Henry Sigerist in the *March of Medicine*, pages 28-51 (New York: Columbia University Press, 1941).

¹¹ *L'Heureux Accouchement des Femmes*, Paris, 1609.

¹² *The Woman's Friend or Midwife*.

MECHANIZED SELLING

(Continued from page 330)

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(Continued on page 356)

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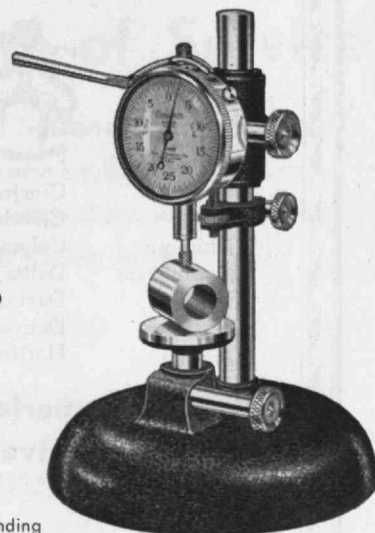
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MECHANIZED SELLING

(Continued from page 355)

nished by the tabulators at the check-out counters, and over-all operating expenses about 10 to 15 per cent lower than those for conventional stores. Some rather large-scale plans are being made for these stores, as indicated by the intention to have about 100 Keedoozle stores in the New York area by 1954. More intriguing, however, is the estimate that the basic system is being studied for application to stock rooms, parts warehouses, drug and hardware merchandising businesses, and similar establishments in which many small and miscellaneous items must frequently be assembled into groups.

In sharp contrast to this gigantic aggregation of automatons is the Food-O-Mat, a self-service store having no intricate or moving mechanisms and mechanically so simple that it is doubtful if the term "machine" can be legitimately applied to it, even though the underlying idea has been patented. In essence, the mechanism of this store is a deep inclined plane about 75 feet long which is cut up into a series of chutes of adjustable width by means of inverted T sections. Each chute is loaded with a line of cans on their side, or with any other article that can roll or slide down the incline. As a customer picks up the bottom item in the chute, the remaining stock moves down to fill the gap, and a group of employees re-

plenishes the supply from the top, as required. Below the supply chute is a return chute for use by those customers who change their minds.

In both Food-O-Mat and Keedoozle stores labor costs are minimized since the task of keeping the supply of goods at the proper level is rendered easier by separating the stockpiling and display functions, and by physically removing stocks from the areas traversed by the customers. In the case of the conventional unit vending machine, however, labor saving is not ordinarily the obvious incentive, for in some fields at least, the over-all cost per sale is no lower than for those cases in which sales are made by human beings. More frequently, the immediate reason for mechanized selling is that machines open up new sales outlets. A vending machine will operate without complaint in places and under conditions that an American clerk would not be likely to endure. The machine will operate at all hours of the day or night, on Sundays, and on holidays, in gasoline stations and subways, on busses and trains. Undoubtedly, the trend toward shorter hours and the five-day week for all types of workers favors their use, as does, in a far more basic way, the high cost of human labor in our economy.

Quite aside from technical reasons, there is little place for a coin machine in China, for example, except as a novelty. The same can be said of almost any area where the cost of building complex machinery is

(Concluded on page 358)



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MECHANIZED SELLING

(Concluded from page 356)

relatively higher, and the cost of maintaining a human being relatively lower than in the United States. "Modernizers of China," says John K. Fairbank† (and he might just as well have named Egypt, Italy, or dozens of other countries as well), "in their attempts to introduce the machine have constantly run up against the vested interest of Chinese man power, since in the short run the machine appears to be in competition with human hands and backs."

As with many other technical developments, the inherent promise of the vending machine is that it will free human labor from routine tasks where man, in effect, acts like a machine, else the substitution could not be made. The greater utilization of human creativeness is one of the brighter potentialities which can be fulfilled — when machines displace people in functions of automatism. Those persons who are thus freed from routine operations become available for other jobs where judgment, ingenuity, experience, and knowledge of personality are needed and which, therefore, cannot be mechanized. Of course there is the inherent danger that some will lack the flexibility and the ability to make the change that is part of the dilemma of the times, a Twentieth-Century aspect of the struggle for existence.

† *The United States and China*, page 30 (Cambridge: Harvard University Press, 1948), \$3.75.

GLASKOGELS

(Continued from page 336)

the appearance of australites far from volcanic sites might be explained by secondary transportation, as, for example, on ice floes or by water generally.

But Suess, the geologist, pointed out that all these "tektites" (he coined the word as a general term for moldavites, schonites, and australites) invariably made their appearance in geologic layers of a certain age, near the end of the Tertiary period. Suess had a wrong guess as to the number of years elapsed since then (we now date these layers as having been formed some 400,000 years ago) but his geological definition was correct. The schonites from Sweden and the australites from the sixth continent, and of course his own native moldavites from Bohemia and Moravia, were always found in layers dating from the end of the Tertiary period. The few exceptions that came to light could be explained as strays, and in some of these cases a secondary transportation by water actually was involved. Human agencies accounted for some others, and the activities of earthworms for still others.

What Suess did not know was that the distribution of all tektites discovered in and since his time follows three different "great circles." This fact alone points to the meteoric origin of tektites. One of the first supporters of Suess was a Dutch scientist, Rogier Diederik Marius Verbeek, who worked on the small island of Belitong or Billiton, situated between Borneo and Sumatra and an important possession of the Nether-

(Continued on page 360)



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lands because of its tin mines. While digging for tin ores, Verbeek brought to light astonishing numbers of "billitonites" again from geologic layers whose age corresponded to that in which the other finds were made. Many of the billitonites were spherical or near spherical so that the Dutch (including Verbeek) called them "glass-spheres," or, in their own language, *glaskogels*. Verbeek wrote a book about the glaskogels of Billiton, compared them with the australites and the other tektites and finally ventured a guess about their origin. There could be little doubt that they had to be meteorites. But since they resembled obsidian so closely, it was quite probable that they had been volcanic originally. Might it not be possible that they were volcanic bombs, just as Darwin had said, but from the craters of the moon?

Geologists read this daring thought with astonishment and decided to obtain further information about certain things from their astronomical colleagues to determine the likelihood of Verbeek's conjecture. Many an astronomer found himself invited for dinner by his colleagues in the university's department of geology. And under questioning the astronomers would have to say that a body would need an escape velocity of roughly one and a half miles per second to leave the moon and its gravitational field. Because of the orbital velocity of the moon itself, a little would have to be added to that figure for the body to reach the earth. One would have to assume an escape velocity of about two miles per second if a volcanic bomb from a lunar crater were to reach the earth. Whether a volcano, here or on the moon, can shoot "bombs" with such a velocity was something that the astronomers were not prepared to say. But they could tell that they were no longer completely convinced that all the round holes on the moon (which had been called "craters" because of habit and tradition) were really volcanic craters. In fact, more and more astronomers began to believe that many of the moon's craters were impact craters, themselves, caused by meteorites falling on the moon's surface.

Following such discussions with their astronomical colleagues, the geologists made a few calculations and decided that they also were not prepared to say whether a volcano could shoot out bombs with a muzzle velocity of two miles per second. Moreover, if the lunar craters were not even certified as being extinct volcanoes, there was little use in pursuing Verbeek's proposal. Thus the matter came to rest in the days just before World War I.

Since then the story has not developed much further. The discovery that all tektite sites are arranged along three great circles has added one more proof to Suess's original assumption that they were meteoric glass. Such additional proof was really not needed as far as the nature of the tektites is concerned, but it indicates that all tektites are the result of a very few highly special meteoric showers.

Recently, Harvey H. Nininger has offered an interesting suggestion which could salvage Verbeek's
(Concluded on page 362)

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GLASKOGELS

(Concluded from page 360)

main idea. Nininger's idea is that the tektites did actually come from the moon under somewhat unusual conditions during the creation of a lunar impact crater. Most astronomers now believe that most lunar craters are impact craters, and the problem of whether a volcano could eject matter fast enough is still not quite settled. But at the point of meteoric impact on the moon enough energy is liberated to provide matter with the necessary escape velocity. Now if the point of impact is in or near the bed of old lunar obsidian flows, pieces of such obsidian might be hurled into space with the necessary velocity. Making all these assumptions, Dr. Nininger proposed to regard the tektites as "lunar impactites."

It is an amusing idea, but there is little that speaks in favor of it and at least two facts speak against it. If the tektites had originated in the manner pictured by Dr. Nininger, there would be a random distribution, whereas the distribution is found to be along only three great circles. Likewise, according to the Nininger hypothesis, there would be a random distribution through time. According to our best knowledge, however, all tektites came from space within a very short time interval, geologically speaking. They seem to be the result of a unique event which took place at a time when man had just acquired the knowledge of simple tools. Undoubtedly a suitable explanation for the origin of tektites will be forthcoming. But until such time as science provides a satisfactory hypothesis, the presence of the green glassy shards of Bohemia, Sweden, and Australia poses a problem for which no adequate solution has been found during man's recorded history. From tektites to Verbeek's glaskogels, these objects will continue to remain mysterious, until a geologist, an astronomer, or some other scientist provides an answer.

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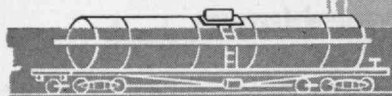
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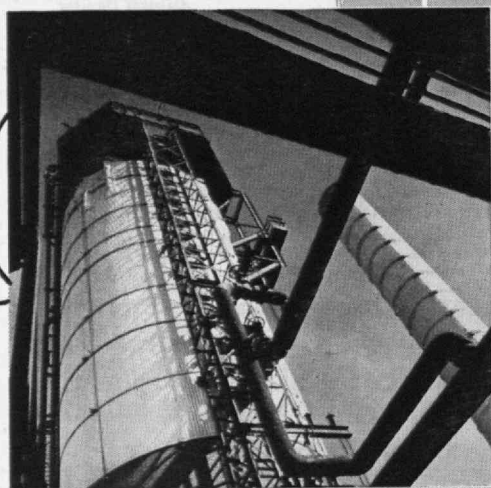
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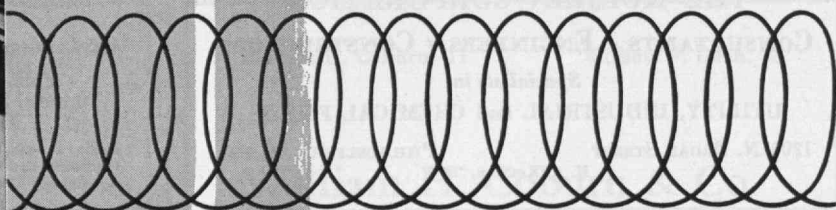
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Your Alumni Fund has just completed its ninth year. During this period we have given a total of almost \$1,250,000, an average of some \$140,000 a year. One of the Institute's greatest needs is increased endowment. Of the goal set for the Development Program, one-half, or \$10,000,000, is for additional endowment. Our annual giving through the Fund has produced an amount equal to the income on more than a third of that amount, about \$3,700,000. Looked at in that light, the accumulated giving of relatively small amounts by a large number of men assumes its true importance.

But we have not, as yet, even approached our full potential. Suppose each of us who gave last year increased the amount of his gift by \$10 this year. The resulting average of \$25.00 (a figure exceeded by many other college funds) would raise that increased endowment equivalent to \$6,250,000. And suppose, in addition, that 50 per cent of our Alumni participate, instead of the present 27 per cent; again, a figure which is exceeded elsewhere. That equivalent endowment would then leap to almost \$12,000,000! That is a figure to conjure with — and it is not an impossibility.

This year will you consider two things? Will you increase the amount of your own gift by \$10? Will you also influence one other alumnus to contribute? We can realize our potential this year if each of us, individually, will accept these two responsibilities. It is up to you.

Alumni AND Officers IN THE News

AWARDS

GEORGE W. BRADY '27 is the winner of the 1948 Sylvanus Albert Reed Award for "his contribution to the development of the reversing propeller resulting in shorter landing runs for large aircraft." The award was presented by the Institute of Aeronautical Science on January 24.

JOHN N. DYER '31 received the Fellow Award of the Institute of Radio Engineers

at its annual banquet on March 9 "for administrative and technical contributions to radio, including polar expedition communications and important wartime radio counter-measures."

DAVID L. MACADAM '36 was awarded a Navy Citation for his contributions as a scientist to the war effort.

CLAUDE E. SHANNON '40 was the recipient on March 9 of the Morris Liebmman Memorial Prize of the Institute of Radio Engineers "for his original and important contributions to the theory of the transmission of information in the presence of noise." Dr. Shannon was awarded the Alfred Noble Prize in 1940 by the American Institute of Electrical Engineers.

ELECTIONS AND APPOINTMENTS

THOMAS D'ARCY BROPHY '16 has been elected chairman of the board of directors of Kenyon and Eckhardt, Inc. Mr. Brophy was elected president of the agency in 1937.

GEORGE D. BUNKER '31 was appointed

as president of the Trailmobile Company in January.

SAMUEL A. GROVES '34 was elected vice-president of the United-Carr Fastener Corporation by the board of directors on February 17.

Professor PHILIP M. MORSE, Staff, was named research director and deputy director of the Weapons Evaluation Group of the National Military Establishment by James Forrestal, Secretary of Defense, on March 1.

AUTHORS

EARL R. HAMILTON '09 and FRANCIS H. ACHARD '13 have prepared a *Glossary of Terms Commonly Used in the Manufactured and Mixed Gas Industries*. Fidelity Press.

NATHANIEL H. FRANK '23 and R. Q. TWISS contributed "Orbital Stability in a Proton Synchrotron" to the January, 1949, issue of *The Review of Scientific Instruments*.

HOWARD A. ROBINSON '30 has edited *High-Polymer Physics*, a 608-page book published under the auspices of the

American Institute of Physics and to which 39 physicists and chemists have contributed. Chemical Publishing Company.

JAMES W. PERRY '31 and Anthony M. Schwartz are the authors of *Surface Active Agents*. Interscience Publishers, Inc., 1949.

ROBERT L. KYHL '47, TUNIS WENTINK, JR., '47 and MALCOLM W. P. STRANDBERG '48 contributed "Rotational Absorption Spectrum of OCS" to the January 15, 1949, issue of *The Physical Review*.

Invited papers by GEORGE R. HARRISON, Staff, and WAYNE B. NOTTINGHAM, Staff,

were presented at the winter meeting of the Optical Society of America held March 10, 11, and 12. The papers were, respectively, "The Ruling of Large Diffraction Gratings" and "A Survey of Present Methods Used to Determine the Optical Properties of Phosphors."

WILLIAM H. TIMBIE, Professor Emeritus of Electrical Engineering, is coauthor with the late Frank G. Willson, of *Industrial Electricity*, Volume II. John Wiley and Sons, Inc., 1949.

TALKS

E. VERNON LEWIS '28 spoke before a meeting of the American Association of Textile Technologists which was held on February 2. Mr. Lewis chose for his sub-

ject, "A Fundamental Study of Some Fabric Properties."

IRVIN R. MITCHELL '30 was the speaker on February 12 at a meeting of the Na-

tional Association of Power Engineers in St. Louis. Mr. Mitchell's subject was entitled, "Wire Rope, Some Practical Fundamentals."

OBITUARY

* Mentioned in class notes.

HENRY W. HOLT '87, October 4, 1947.
BERTRAND R. T. COLLINS '88, March 3.*
SANFORD E. THOMPSON '88, February 25.*
WILLIAM W. LEWIS '89, February 11.
FRANCIS S. BLAKE '92, October 22, 1944.
LAURENCE B. MANLEY '92, February 11.*
GEORGE E. BARSTOW '94, February 12, 1948.
ALICE MACOMBER GREENWOOD '95, in 1945.*
REID McMANUS '95, November 11, 1948.*
RUSSELL W. PORTER '96, February 23.
FRANKLIN BAKER, JR., '97, May 30, 1946.
HENRY A. CLARK '97, January 9.*
CHARLES H. EAMES '97, January 29.*
JAMES L. FYFE '97, January 21.*
BERTRAM C. RANSOME '97, June 30, 1918.*

JAMES F. MUHLIG '98, date unknown.
ALFRED W. HARRISON '99, in May, 1948.
GEORGE R. HECKLE '99, January 17.*
ARTHUR E. HOXIE '99, in June, 1948.*
DAVID C. MILLS '99, November 2, 1948.*
HARRY H. MORTON '99, August 31, 1945.
EDWARD E. BUGBEE '00, February 2.*
CHARLES A. MACE '01, January 3.*
JOHN H. DRAPER '04, December 18, 1948.*
HENRY M. FLINN '04, in 1948.
ARTHUR O. ROBERTS '04, February 1.*
ROBERT P. NICHOLS '05, December 27, 1948.*
GEORGE R. TAYLOR '07, January 17.*
FREDERIC R. BARKER '13, February 25, 1946.
FRANCIS P. GILBERT '14, January 17.*
WILL P. WATSON '15, December 20, 1948.
GEORGE J. MEAD '16, January 21.*

RUSSELL H. WHITE '16, February 19.*
ROBERT W. VAN KIRK, JR., '18, February 12.
AUGUSTIN C. TITUS '20, December 7, 1947.
DAVID WEXLER '20, January 5.*
DWIGHT BALDWIN '21, January 7.*
ROBERT E. BEARD '21, December 22, 1948.*
RICHARD DONOVAN '21, February 7.
CURTISS T. GARDNER '21, February 10.*
FRANCIS R. WHELTON '21, March 6, 1946.
V. JOSEPH ALTIERI '23, February 10.
GERALD M. NAUMAN '23, April 25, 1948.
GEORGE C. WOLFE '23, May 20, 1948.
ERWIN H. HAGEN '24, November 4, 1936.
HAROLD H. SIEGEL '25, October 22, 1948.
EVERETT H. SMITH '28, October 14, 1948.
WILFRED J. PUCKE '34, January 29.
JAMES G. MACEE '40, in December, 1948.

News FROM THE Clubs AND Classes

CLUB NOTES

M.I.T. Club of Buffalo

The Club has suffered two losses in recent months. One of our senior members and member of our board of directors, Marvin Gorham '93, passed away on December 21, 1948. Marv held a special place in the hearts of all the members of the Club and is very much honored both for his many years of guidance of the Club and also for the outstanding citizen of our city that he was. — The other loss to our Club we meet with regret and pleasure. Bernie Nelson '35, President of the Club, has been transferred to the New York office of the New York Telephone Company. Although we are indeed sorry to lose Bernie, who has done such a fine job of administering club affairs, we are pleased at this opportunity for him.

The Club held its first meeting of the new year on February 24. The meeting took the form of a plant visit through the Cordura, Cellophane, and Sponge departments of the E. I. du Pont Company, River Road, Buffalo. Among the approximately 50 members who attended were: Robert M. Atwater '39, Howard E. Britton '38, Roy Burgwardt '48, C. B. Dale '43, R. E. Dow '01, Bruce Caviller '48, Gabe Hilton '15, A. E. Hitt '36, V. Hwoschinsky '40, Frank Jones '48, Barrie Mackenzie '43, William R. McEwen '15, James F. Patterson '36, T. B. Roessel '47, C. J. Sciandra '47, J. T. Walsh '15, D. G. Welch '26. Our thanks go to Jim Patterson '36 who served as chairman for the meeting and made all the necessary arrangements. — MATTHEW N. HAYES '36, *Secretary*, 45 Manchester Place, Buffalo 13, N.Y.

M.I.T. Club of Chicago

Tech Night of the Club was held at the Electric Club on Tuesday evening, February 8. President, Herb Kochs '24, opened the meeting by introducing Event Chairman Ed Farrand '21. Ed, in his inimitable way, introduced Professor William Campbell '15, Head of the Department of Food Technology and presently Executive Director of the M.I.T. Development Program. In opening his talk, Professor Campbell called attention to the Mid-Century Convocation at Technology, on March 31, April 1 and 2. This outstanding event will be world wide in scope and many persons of national prominence will take part in it including Winston Churchill, President Truman, Dr. Conant, Dr. Compton, and President Killian '26. The Convocation is to be televised and arrangements are now being made to obtain the one and only 12-foot television screen in the country for use at Cambridge to permit the student body to witness the various programs.

Our speaker stated that there is more physics research going on at the Institute than in the rest of the eastern schools and colleges combined. While Technology has both the equipment and the men, it has a very definite need for proper buildings to house and protect such equipment from damage or loss. The portable and temporary buildings now in use present fire hazards which might result in irreparable damage to the tremendous amount of specialized equipment. At the close of his most interesting talk, Professor Campbell opened the meeting for questions from the floor which brought out the following information: In the approximately 800 students admitted to the freshman class, some 530 secondary schools are represented, which reflects the wide scope and varied nature of M.I.T.'s student body. Tuition this fall will be raised to \$800 a year. It costs the Institute approximately 30 per cent over actual tuition to educate each student. The Institute is endeavoring to stabilize enrollment at 4,500; pre-war enrollment was 3,000. Technology has about four applicants for each student actually admitted to the freshman undergraduate classes. The undergraduates are, numerically, approximately twice the size of the graduate group. — Seated at the head table were: Professor William Campbell '15; President Herb Kochs '24, Diversy Corporation; Secretary John Praetz '28, Liquid Carbonic Corporation; Treasurer Dick Meyer '42, Stewart-Warner Corporation; George Wallis '09, Creamery Package Manufacturing Company; Sherry O'Brien '17, Thermel, Inc.; Ed Farrand '21, United Conveyor Corporation; and Dick Mason '31, Mason, Kolehmainen, Rathburn and Wyss.

Dick Meyer reports that we have the highest paid membership that ever existed in the history of the Club. We now boast 362 men in good standing. How about the rest of you exemplary engineers remitting the annual pittance to our club treasurer?

Announcements. Compton-Killian Dinner Thursday night, April 14. Be sure to mark your calendar pad now reserving this date. This will be the outstanding event in the history of the Club. Make it a *must* on your schedule. While it is scheduled as a stag evening, it is suggested that as many of our alumnae as possible attend this occasion. Your committee, hard at work making arrangements, will be glad to set aside one or more tables for the coeds. This will be a marvelous opportunity for you ladies to renew or make new acquaintances and partake in this outstanding occasion. Guests will, of course, also be welcome. — Special honors will be paid to M.I.T.'s Professor Emeritus Warren K. Lewis '05 at the Edgewater Beach Hotel on the evening of May 7 upon the presentation of the Gold Medal Award for 1949 at the 26th annual meeting of the American Institute of Chemists. Dr. Killian '26 will be one of the speakers. Our Chicago Alumni, and particularly you chemical

engineers, are invited and urged to attend. — President Kochs announced that Dr. Norbert Wiener of Technology's faculty spoke at the February meeting of the Institute of Radio Engineers at the Museum of Science and Industry.

Regrets. Ted Robinson '84 passed away on December 30. Don Williamson '10, President of Williamson Adhesives, Inc., passed away early in January. In these men, the Club loses two of its most respected and substantial members. To their families, our sincerest sympathy in their grief.

Thanks. President Kochs thanks Event Chairman, Ed Farrand '21, who so ably handled the duties of toastmaster, Dick Mason '31, who arranged for the fine food and refreshments, Dick Meyer '42, who handled the financial arrangements and John Stetson '43, who assisted on the door desk. — JOHN G. PRAETZ '28, *Secretary*, The Liquid Carbonic Corporation, 3100 South Kedzie Avenue, Chicago 23, Ill.

M.I.T. Club of the Connecticut Valley

A dinner meeting was held by the Club on February 16 at Blake's Restaurant. Our guests included Harold C. Dudley of the Financing Development Committee; Donald P. Severance '38, who showed us the film, "M.I.T. in 1948"; B. A. Thresher '20, who spoke on postwar admissions at the Institute; guest speaker Captain Bruce Rowlett; and Marcus M. Kiley.

Alumni present included the following: Robert C. Albro '07, Bissell Alderman '35, Louis DeB. Bartlett '14, Leo Beaulieu '19, Philip S. Benjamin '32, John A. Berges '40, A. E. Brigham '36, Bernard Canter '30, B. G. Constantine '26, Richard S. Carroll '28, Ralph E. Curtis '15, F. T. Davies '41, Lawrence Davis '17, F. D. DeBell '44, Kenneth A. Devine '33, Minot Edwards '22, Burton E. Geckler '05, Thomas W. Hafer '35, Henry D. Johnston '27, John Kapinos '40, David G. Kobick '47, Ted Kresser '34, Ted Lange '01, W. D. Leshure '22, Albert M. Lovenberg '16, Bob Marlow '17, Edmund P. Marsh '89, John Newbegin '34, A. G. Payne '33, L. J. Powers '23, Donald L. Ross '27, Irwin Sagalyn '37, Cecil A. P. Thomas '26, John R. Thompson, and Backman Wong '48. — ALBERT M. LOVENBERG '16, *Secretary*, 66 Belmont Avenue, Springfield, Mass.

Detroit M.I.T. Association

The Association held its regular meeting on February 8 at Huyler's L'Aiglon in the Fisher Building, Detroit. The dinner meeting started at 7:00 P.M. Officers for this year are as follows: President, John T. Cronin '17; Vice-president, L. Willis Bugbee, Jr., '21; Secretary, R. Gordon Spear '26; and Treasurer, Thomas F. Morrow '35.

Following the reading of the Secretary's and Treasurer's reports, the speaker of the evening was presented. Theodore Baruch

of Wayne University spoke on the subject, "The United Nations and World Government." Professor Baruch gave a very interesting account of the United Nations' formation and activities, together with some of the foremost arguments which have been presented by persons in favor of a world government as a successor to the United Nations. A question period of some 30 minutes followed, in which members had an opportunity to ask Professor Baruch's opinion and to express their own on various phases of the subject under discussion.

Alumni attending the meeting were: 1913: F. N. Phelps, E. D. Pratt; 1916: T. K. Hine; 1917: J. T. Cronin, C. T. Ellis, A. C. Litchfield; 1921: L. W. Bugbee, Jr.; 1922: E. A. Ash, C. H. Burnham; 1924: E. V. Martin; 1925: A. M. MacCleery, D. B. Martin; 1926: J. E. Longyear, R. G. Spear, D. M. Sutter; 1929: H. F. Green; 1933: B. Tashjian; 1934: C. Ayers; 1935: T. F. Morrow; 1945: H. C. Lawrence; 1947: J. Karmazin, Jr.; 1948: C. W. Hilton, W. H. Reid, Jr. — R. GORDON SPEAR '26, *Secretary*, Fisher Body Division, General Motors Building, Detroit 2, Mich.

The M.I.T. Club of the Kanawha Valley

Under the leadership of William S. Brackett '23, Honorary Secretary for Charleston, a group of Alumni met at the Daniel Boone Hotel, Charleston, W.Va., on January 17, to make plans for local participation in the M.I.T. Development Program. William L. Campbell '15, Executive Director of the Development Program, and L. B. Avison, Jr., of the campaign consultants, presented an interesting and graphic picture of the \$20,000,000 undertaking. Present at the dinner were Harold Y. Keeler '18 from Huntington, William S. Brackett '23, Irvin L. Murray '26, Benjamin T. Woodruff '36, Joseph C. Jeffers, Jr., '40, Daniel G. Hulet '42, and Howard P. McJunkin '43. — DANIEL G. HULET '42, *Secretary*, 1595 $\frac{1}{2}$ Quarrier Street, Charleston 1, W.Va.

The M.I.T. Club of the Lehigh Valley

The Club held its first winter meeting on December 9 at the Wyomissing Club in Reading, Pa. Forty-nine club members turned out to greet H. E. Lobdell '17, Executive Vice-president of the Alumni Association, and Don Severance '38, the Alumni Secretary. This meeting raised the level of enthusiasm in club spirit to a new high largely through the efforts of Ed Ingram '25 who headed an all-Reading committee on arrangements.

The dinner meeting was attended by the following: Adams, William K. '47, Bamford, James B. '26, Bassett, William V. '39, Benbow, David F. '12, Bielecki, Edwin J. '44, Blake, Malcolm S. '25, Briggs, John D. '42, Butts, Allison '13, Coburn, F. Ward '01, Coburn, Fordyce '27, Cogan, Paul V. '13, Cutten, L. H. '07, Cutten, W. K. '39, Evelev, Yale '18, Flynn, E. J. '19, Fox, Sidney V. '35, Garcelon, George F. '33, Gastrich, Henry G. '47, Gotherman, Charles W. '13, Graham, Hugh S. '47, Henninger, John H. '24, Herasimchuk, M. V. '39, Ingram, E. J. '25, Kase, Paul G.,

Jr. '44, Kawecki, Henry C. '34, Lobdell, H. E. '17, Lyons, H. T. '27, Meinig, Ernst H. '25, Meyers, George J., Jr. '29, Moggio, Henry '28, Muhlenberg, Charles H., Sr. '92, Muhlenberg, Charles H., Jr. '22, Muhlenberg, Charles R. '25, Peterson, E. C. '37, Putnam, Otto A. '33, Reid, Allen W. '12, Severance, D. P. '38, Smith, Albert C. '27, Stoughton, Bradley '96, Taylor, Allyn C. '06, Vint, Alan W. '30, Weiss, Irwin K. '39, Wilbur, Harold R. '10, Wilson, Louis A. '14, and nine guests. — MICHAEL V. HERASIMCHUK '39, *Secretary*, Post Office Box 495, Bethlehem, Pa.

The M.I.T. Club of Lower Ontario

The visit of Dr. Compton to Toronto on January 10 will long be remembered by the Alumni in Ontario. Invited by the University of Toronto to deliver the second Wallberg Lecture on January 11, Dr. Compton arranged to arrive one day earlier in order to meet with the Alumni. With two full days in Toronto, the members of the Club took advantage of every opportunity to make his visit a full and enjoyable one. The directors of the Club and the Honorary Secretaries in the district entertained Dr. Compton on the day of his arrival with an informal luncheon at the National Club.

Following a visit to the University of Toronto in the afternoon, a Ladies' Night dinner meeting was held at the Granite Club at 7:30 P.M. At the reception held prior to the dinner, over 70 club members and their wives met Dr. Compton. Since this was Dr. Compton's first visit to Toronto, it was a memorable occasion for the Alumni. This was the first Ladies' Night ever held by the Club and as such it was a splendid success. Members were present from far and near with E. Ralph and Mrs. Rowzee '30 of Sarnia coming from a distance of nearly 200 miles. The Honourable R. H. Winters '33, Minister of Reconstruction and Supply in the Dominion Government made a special trip from Ottawa to introduce our guest of honour and Augustin Frigon '11, General Manager of the Canadian Broadcasting Corporation, came to Toronto for the occasion in order to thank him on behalf of the Club. Two members of the Quebec Club, H. C. Pearson '23, President, and L. A. Fraikin '31, a councilor, also came from Montreal to be present with us on this gala occasion. The enthusiasm of the members for Dr. Compton's address coupled with the fact that the attendance was the best ever recorded, was convincing evidence that the evening was highly successful. After the meeting, our special guests, the directors and a few members were invited to the home of Denton Massey '24. The following morning the club directors arranged for a tour through the A. V. Roe Company, the only Canadian plant making jet aircraft engines. While this concluded the planned activities of the Club, many members turned out again on Tuesday evening to hear Dr. Compton deliver his lecture at Convocation Hall entitled, "The Scientist and the Engineer."

Alumni attending the Ladies' Night dinner meeting, most of them with their wives, were: G. W. Arnold '11, D. R. E. Barnaby '38, H. L. Bemis '35, E. I. Birn-

baum '30, L. B. Black '14, Winnett Boyd '40, C. P. Brackett '22, John Buss '26, M. C. Coutts '39, R. G. Drinnan, Jr. '33, Homer Duggan '25, R. H. Farmer '36, F. P. Flett '20, L. A. Fraikin '31, Augustin Frigon '11, R. B. Graham '39, R. H. Guthrie '39, F. J. Heath '40, J. K. Jamieson '31, J. S. Keenan '23, G. R. Lord '32, E. M. G. MacGill '34, S. R. MacKellar '12, J. W. MacLaren '47, Denton Massey '24, R. R. Moffat '31, R. T. Monrad '40, B. H. Morash '12, H. C. Patten '08, E. M. Peacock '47, H. C. Pearson '23, R. H. Peene '23, Basil Rabnett '43, D. P. Rogers '15, E. R. Rowzee '30, Samuel Seaver '05, H. V. Shipley '23, S. M. Thomson '26, G. F. Tracy '26, G. N. Wedlake '28, F. W. White '18, R. M. Williams '27, R. H. Winters '33, D. S. A. Young '27. — G. ROSS LORD '32, *Secretary*, Mechanical Engineering Department, University of Toronto, Toronto 5, Ontario, Canada.

The M.I.T. Club of New York

On Wednesday, February 16, heavy rain notwithstanding, some 50-odd loyal sons of M.I.T. trekked into the Architectural League to hear Horace Ford's interesting comments on the Institute. Horace gave us the first inside picture of the coming convocation ceremonies which will be held in Cambridge the last day of March and the first two days of April. We were extremely interested in learning that no less personages than Winston Churchill and President Truman have both been invited to attend and have accepted for the occasion. Some 30,000 invitations to these events have been mailed out by the Corporation. Ticket requests have come in in such overwhelming numbers that arrangements have been made to hold the two evening meetings in the Boston Garden.

The following men were present at the meeting: G. R. Wadleigh '97, Maurice R. Scharff '09, J. B. Nealey '11, W. Joseph Littlefield '17, S. W. Fletcher '18, Lawrence Flett '18, Harry J. Kahn '20, W. F. Kennedy '21, L. B. Davis '22, Duncan R. Linsley '22, R. C. Rundlett '22, Dale Spoor '22, Jack Teeter '22, Ray Hamilton '24, Gregory Shea '24, Edward Wininger '24, L. G. Cumming '26, H. S. Ford, Jr., '31, Jack Andrews '33, A. N. Mooradian '34, H. R. Schwarz '34, D. F. Taylor '35, F. B. Grosselinger '38, Thomas F. Creamer '40, R. C. Swann '41, Harvey Kram '42, John Harsch '43, Stephen Eppner '45, John E. Plantinga '45, Morgan H. Cooper '47, Al Extence '47, M. J. Doyle, Jr., '48, John M. Randolph '48.

Your Secretary was requested by several in attendance to have notices of meetings sent out at least three weeks in advance and we shall try to do this in the future. Sometimes, however, the uncertainties of our speaker's acceptance makes this impossible. — Many of the old-timers will be glad to know that a letter from Dr. Duff '86, received from Gloucester, Mass., gives every indication of his good health and enjoyment of life. He is still a keen supporter of the M.I.T. Club of New York and continues to come up with constructive suggestions on better housing facilities. If you are reading these columns, Doc, each and every one of your loyal friends sends a barrel of good wishes for your continued health and prosperity. We are looking forward eagerly to see you at the convocation exercises and I hope you

will make it. His address, for those who would like to drop him a note, is Hammond Hall, Gloucester, Mass.

During the month of January, Gordon Powers'34 signed up as a new member. New addresses are as follows: J. C. Duff '86, Hammond Hall, Gloucester, Mass.; Lansing T. Carpenter'21, Russell Manufacturing Company, Middletown, Conn.; John G. Martin'47, 8910 35th Avenue, Jackson Heights, Long Island, N.Y.; Frederick W. Lord'93, 238 East 68th Street, New York 21, N.Y.; David B. Nicholson'42, 28 East 10th Street, New York 3, N.Y.; Egbert C. Hadley'14, 564 Harbor Road, Southport, Conn.; William Kalker'26, 17 School Lane, Scarsdale, N.Y.; W. R. Franklin'26, 2133 Plumas Street, Reno, Nev.; Robert S. Blair'00, Blair and Black, 19 East 47th Street, New York 17, N.Y.; Mark E. Sullivan'47, 1216 Upper Ridgeway Road, Charleston, W. Va.; E. S. Worden, Jr.'31, 9 Murvon Court, Westport, Conn.; Charles B. Holland'37, Apartment 15c, Number 4, Redfield Village, Metuchen, N.J.

On Wednesday the 23rd, the Club held its annual luncheon in connection with the Technical Association of the Pulp and Paper Industry at the Engineers Club which was attended by some 58 Alumni. John Buss'26 from Toronto was the chairman and both Sam Reynolds'22 and George Dandrow'22 gave short talks of welcome. For next year at this occasion, Lawrence Flett'18 was elected chairman. Mike, incidentally, is president of the American Institute of Chemists.

Those in attendance were as follows: G. R. Wadleigh'97, Consulting Engineer; C. E. Chase'03; P. B. Sadtler'06, G.A.T.C.; Pierre Drewsen'12, Consultant; George B. Zimmele'14, W. A. Cleary Corporation; Allen Abrams'15, Marathon Corporation; Douglas H. McMurtrie'15, Brown Company; Walter S. Aiken'16, Clark-Aiken Company; Val Gooding'16, Strathmore Paper Company; Frank Maguire'17, Standard Cap and Seal Corporation; John L. Parsons'17, Hollingsworth and Whitney Company; S. W. Fletcher'18, J. O. Ross Engineering Corporation; Lawrence Flett'18, National Aniline Division; R. B. MacMullin'19, R. B. MacMullin Associates; Foster P. Doane, Jr.'20, Sandy Hill Iron and Brass Works; Walter A. Sherbrooke'20, Piping Specialties, Inc.; Frederick W. Binns'21, Virginia Smelting Company; Hilliard D. Cook'21, Sweet Brothers Paper Manufacturing Company, Inc.; Clyde A. Benson'22, Arno W. Nickerson; George Dandrow'22, Johns-Manville Company; Henry S. Dimmick'22, SKF Industries, Inc.; R. G. Macdonald'22, Technical Association of the Pulp and Paper Industry; Sam H. Reynolds'22, Crucible Steel Company; George W. Bricker, Jr.'23, Robert Heller and Associates; W. L. Keplinger, Jr.'24, Johns-Manville Company; H. Gregory Shea'24, H. Gregory Shea Company; James C. Walker'24, Johns-Manville Company; John Buss'26, Provincial Paper, Ltd.; R. F. Charles'26, Dennison Manufacturing Company; A. C. Lamoureux'26, Dennison Manufacturing Company; N. F. Wilmot'26, Mathieson Chemical Corporation; H. T. Barker'27, Bird and Son, Inc.; Harold W. Bialkowski'28, Weyerhaeuser Timber Company; S. A. Brown'28, Rogers Corporation; K. J. Mackenzie'28, Eastman

Kodak Company; Robert J. Proctor'28, Fitchburg Paper Company; Howard S. Gardner'30, Fibreboard Products, Inc.; R. D. McCarron'30, Stein Hall and Company, Inc.; R. B. Porter, Jr.'31, American Cyanamid Company; C. D. Cummings'32, SKF Industries, Inc.; Robert T. Emerson'32, Manifold Supplies Company; E. N. Poor'32, Hudson Pulp and Paper Corporation; Lawrence Whitaker'32; R. T. Greep'34, S. D. Warren Company; Simon Malkin'34, A. L. Smith Iron Company; John Bainbridge'35, Monsanto Chemical Company; Roy P. Whitney'35, Institute of Paper Chemistry; F. P. Thornton, Jr.'36, Stowe-Woodward, Inc.; Pyram W. Williams'36, Robertson Paper Box Company, Inc.; John G. Rote, Jr.'38, Standard Cap and Seal Corporation; Paul J. Shirley, Jr.'38, Penick and Ford, Ltd.; Sol Baker'39, Rogers Corporation; Siegbert J. Oettinger'39, Artisan Metal Products, Inc.; D. F. Lowry'40, Penick and Ford, Ltd.; George E. Niles'40, Monsanto Chemical Company; Ralph N. Thompson'40, Calgon, Inc.; Edgar Andrews'45, Brown Instrument.

Since our last report we have been advised of the following Alumni passing away: Franklin Baker, Jr.'97; George R. Heckle'99; Kenneth O. Major'07; Reginald L. Jones'09; Chester R. Painter'21; and Colby W. Bryden'22. — At our next meeting on April 13, Professor Warren Lewis, Head of the Department of Chemical Engineering, will be our speaker. — In closing, I would like to advise that our annual spring golf outing will be held on June 17 at Scarsdale Country Club. This gives Larry Davis his much sought opportunity to again hang on to the President's cup. — WILLIAM W. QUARLES'24, Secretary, 330 West 42d Street, New York 18, N.Y.

M.I.T. Club of Philadelphia

A high point in the club's activities is always the annual meeting on the third Tuesday of January. This year the affair was especially notable for three reasons: It was held in the grand ballroom of The Warwick much to the satisfaction of all the people present; the wives of the Alumni were invited to attend; and our distinguished guests were Dr. and Mrs. Compton and Dr. and Mrs. Killian. Dr. Compton related how the change in the Institute's administration had come about, and Dr. Killian spoke on the important problems and plans for the future at Technology.

George T. Logan'29, chairman of the nominating committee, presented the following slate which was elected unanimously for one year: President: Robert E. Worden'36; First Vice-president: Charles W. Stose'22; Second Vice-president: Robert M. Harbeck'28; Third Vice-president: Robert L. Hershey'23; Secretary: Samuel K. McCauley'41; Assistant Secretary: William H. Peirce'46; Treasurer: Frank S. Chaplin'32; Assistant Treasurer: William H. Bertolet, 3d, '48; Executive Committee: James McGowan, Jr.'08, Henry S. Dimmick'22, William H. MacCallum'24, John Lawrence'32, Proctor Wetherill'34, James S. Thornton'41, and Daniel J. Horan, Jr.'48.

A total of 157 Alumni, wives and guests attended the dinner. Those present were: Arnold S. Ackiss'30; Claude A. Anderson'05; Herbert W., and Mrs. Anderson'15; Wilfred Bancroft'97 and Henry Scattergood, guest; Anthony P. Barbato'44; J. Justin Basch'17; Walter J., and Mrs. Beadle'17; Martin J., and Mrs. Bergen'26; H. L. Bowman'14; E. H. Bowman'47; George R. Bull, Jr.'35; Nicholas E. Carr, Jr.'39; Roland E., and Mrs. Cernea'25 and William and Mrs. Bates, guests; Frank S., and Mrs. Chaplin'32; Philip H., and Mrs. Chase'09; Morris A. Chomitz'46; Chih Teih Chu'22 and I. C. Cornog, guest; J. Ernest D., and Mrs. Clarkson'21; Norman A. Copeland'36 and Gladys T. Young, guest; Wiley F., Jr., and Mrs. Corl'39; Paul J. Culhane'23; Curtis D. Cummings'32; Henry S., and Mrs. Dimmick'22; John L. Dodson'31; Leo E., Jr., and Mrs. Duval Jr.'43; William W., and Mrs. Eaton'97; Carlos P. Echeverria'12; Louisa J. Eskridge'39; Charles J. Fisher'46; Robert G. Fisher'44; Donald R. Funk'29; Ezra Garforth, Jr.'48; Richard L. Graff'39; Joseph Greenblatt'22; Edward S., and Mrs. Halfmann'36; Robert M., and Mrs. Harbeck'28; Stanley D., and Mrs. Hartshorn'23 and Mrs. Richard A. Bard and John A., and Mrs. Plimpton'22, guests; Greville Haslam'15; Edward J. Healy'23; Robert L., and Mrs. Hershey'23; Daniel J. Horan'48; Howard Humphrey'26; Knut J. Johnsen'41; Henry W., and Mrs. Jones'26; John F. Joyce'29; Conrad H. Kner'48; Robert E. Krucklin'42; Harry A., and Mrs. Kuljian'19; John and Mrs. Lawrence'32; George T., and Mrs. Logan'29; Robert A. Lombard'47; Kenneth S., and Mrs. Lord'26; William H., and Mrs. MacCallum'24; William A. MacQuarrie, Jr.'26; Samuel K., and Mrs. McCauley'41 and Louise Bolger and Alvin J. Ragan, guests; George C. McFarland'24; James McGowan, Jr.'08; Morell and Mrs. Marean'30; Robert H., and Mrs. Meier, Jr.'47; Martin T. Meyer'32; John R. Mitchell'48 and James J. Hourihan, Jr., guest; Jack L. Mohr'47; Herbert R. Moody'41; M. Bernard Morgan'26; Bernard Morrill'47; Allan Q. Mowatt'35; Leonard Muldrew'48; Clayton E. Mullins'38; Albert M. Naulty'47; William G. Osmun'40; William H. Peirce'46; Leonard C., and Mrs. Peskin'29; Frank O., and Mrs. Pierson'29; Rene A. Pouchain'17; Oden B., and Mrs. Pyle'16; Holden C. Richardson'06; Robert W., and Mrs. Richardson'26; Robert E. Ritterhoff'46; George F. Rowell'92; Thomas J. Schlottemmier'48 and Mary E. Hunter, guest; Dexter N., and Mrs. Shaw'22; Ralph M. Shaw, Jr.'21; Granville B. Smith'18; Edward B., and Mrs. Snyder'39; C. Willis and Mrs. Stose'22; Lewis P. Tabor'22; Harry S. Toole'17; Helen F. Tucker'33; Dexter A. Tutein'17; Hiram L., and Mrs. Walker'05; William H. Wannamaker, Jr.'30; Cyrus H. Warshaw'47; Franklin E., and Mrs. Washburn'26; Robert W. Weeks'13 and David A. Kay, guest; Charles B., and Mrs. Weiler'25; Edward A. Weissbach'16; Richard M. Westfall'37; Proctor and Mrs. Wetherill'34; Edmund A., and Mrs. Whiting'15; George E. Whitwell'14; Charles B. Wooster'29; Robert E., and Mrs. Worden'36; and Robert K. Wright'13.

It is with deep regret that we learned of the death of Laurence B. Manley'92. Mr.

Manley for many years has been active in the Philadelphia Club. A graduate of Course I, he had been retired for some time. — Two of our Philadelphia Alumni of the Class of '39 have joined the ranks of the country squires. Nick Carr'39 has acquired a five-acre farm and is very busy cutting wood. The house is said to have a fireplace in every room. Wiley Corl'39 has a beautifully remodeled country home including such luxuries as radiant heating and a sun room for the little Corls. — The Club's membership continues to grow and now totals a record 331 Alumni. We are expecting a record attendance at the spring meeting to be held on Tuesday, May 17, in the duBarry Room, Hotel duPont, Wilmington. More about the program in the May issue.

For information about Alumni in the Philadelphia-Wilmington area, telephone Boulevard 0287. — SAMUEL K. McCauley '41, *Secretary*, 288 Copley Road, Upper Darby, Pa. *Assistant Secretaries*: WILEY F. CORL, JR., '39, Box 358, Bryn Mawr, Pa.; WILLIAM H. PEIRCE'46, 532 East Mermaid Lane, Chestnut Hill, Philadelphia 18, Pa.

M.I.T. Club of Schenectady

The Club held a luncheon meeting at the Young Women's Christian Association on February 3. The speaker was William M. Murphy, professor of English at Union College and candidate for Congress from the 31st district of New York State in the last election. Professor Murphy first discussed the election and his interpretation of the results, and then outlined his views on what might be expected of the new Congress on such matters as labor-management relations, military expenditures, and international commitments. His talk was followed by a lively question period.

Present were: J. B. Taylor'97, P. M. Currier'14, V. Y. Dunbar'16, K. P. Coachman'22, G. C. Houston'27, G. T. Bevan'31, Benjamin Wilbur'32, C. F. Barrett, Jr., '34, L. H. Dee'35, R. W. Newman'36, C. C. Wetmore'37, Harold Chestnut'39, I. W. Collins'41, G. M. Ketchum'41, J. S. Quill'41, R. W. Stanhouse'41, R. W. Austin'42, L. I. Kramer'43, David Jealous'44, W. B. Rodeman'44, J. T. Harvell'47, A. M. Varner'47, N. M. Bengtson'48, Francis Brown, Jr., '48, and J. A. Guida'48. — IVOR W. COLLINS'41, *Secretary*, General Electric Company, Building 56-201, Schenectady 5, N.Y.

M.I.T. Club of Southern Texas

H. E. Lobdell'17, our congenial and appreciated Vice-president of the Alumni Association, arrived from Dallas on February 20 and made his headquarters with us for several days. He was given a banquet at the Hotel Texas State on the evening of February 22, on which occasion Alumni of Southern Texas and Southern Louisiana had the pleasure of hearing from H.E. the highlights of the progress of our Alma Mater since he was last here. In addition to his address, a fine film, "M.I.T. in 1948," was shown, treating us to scenes around Technology that one would find there now. The two-reel 40-minute film had its premiere early in February in Cambridge. Hollywood, take

note! In addition to the banquet honoring Mr. Lobdell, a number of luncheons, dinners and field trips were held. — JOSEPH H. McEvoy'21, *Secretary*, 202 McGowen Avenue, Houston 6, Texas.

The M.I.T. Club of Tulsa

The *Tulsa Engineer*, monthly bulletin of the Engineers Club of Tulsa, recently honored Otto E. Kirchner'24 as Tulsa's engineer of the month with a picture and full column on his achievements. Kirchner is director of engineering for American Airlines with 20 years of service throughout the entire system. He has achieved national recognition in his field as co-author of the *Aeronautical Drafting Manual* of S.A.E., an important step toward standardization of engine, propeller, and parts drawings in the interest of greater manufacturing efficiency and economy.

The February 16 social hour and dinner meeting in honor of Harold E. Lobdell'17 was attended by 25 Alumni with 10 wives and six guests. Mr. Lobdell brought two reels of new M.I.T. pictures which were exceptionally good, and then he entertained the group from his unlimited store of knowledge of the Institute, past and present. — WALTER S. SMITH'30, *Secretary*, 410 McBirney Building, Tulsa 3, Okla.

Washington Society of the M.I.T.

Bob Thulman's vest pocket pari-mutuel system of figuring the odds may have had something to do with how the ponies paid off at Trotter Night. Trotter Night is on its way to becoming an annual event of the Society. This year the perverse nags crawled around the track at the Engineers' Club on January 12.

As in last year's success, after a convivial opening hour or two, including a buffet supper, bookies appeared in the persons of Bill MacMahon'22, Nick Stathis'29, and Joe Houghton'26. These fellows noisily sold bets on horses for \$50 a bet. We used special money, available only from George Mock'28 at a ridiculously low price per thousand dollars. Long before we had time to complete our business with the bookies, Bob Thulman'22 roared that bets were closed. Then came a noisy report from each bookie on his volume of business. It was really amazing how Bob ground out the odds in no time at all. He credits Course XV. After six hilarious races, and you never heard such a noisy blend of encouragement for some horses and condemnation for others, the thousand dollars we each had at the beginning was redistributed. With M.I.T. thoughtfulness, the committee did not encourage the winners to wander away with their winnings, but, on the contrary, staged an auction. High-class items ranging from a lady's handbag to shoe laces were sold to the highest bidder under the hammer of auctioneer Thulman. Only special money was good at the auction. Kiwi shoe polish brought \$4,000 a can. Book ends went for \$12,000. As advertised, the group couldn't lose since the total cost of goods auctioned exceeded the total amount paid for the special racing roll of bills. As we broke up close to midnight, voices on all

sides were demanding, "We'll have to stage this again next year."

Present were: G. L. Arnold'30, E. S. Bates'24, H. M. Baxter'17, A. E. Beitzell'28, A. F. Bird'30, C. F. Blanchard'22, M. J. Block'41, J. R. Bloom'30, C. W. Bohrer'33, F. A. F. Cooke'39, Harry Fine'34, C. A. Frank'24, J. A. Furer'05, L. J. Grayson'19, O. B. Hartman'43, J. H. Henry'48, A. S. Heyser'26, H. D. Hoffman'27, J. Y. Houghton'26, J. E. Houghton, Jr., '29, J. J. Jones'42, G. G. Lorenz'34, Richard McKay'21, W. K. MacMahon'22, R. N. Maglathlin'45, Louis Michelson'40, G. D. Mock'28, J. C. Morse'14, I. R. Paris'14, W. G. Peck'40, W. H. Phillips'28, J. A. Plugge'29, F. S. Pohanka, Jr., '44, H. W. Poole'30, E. B. Roberts'21, A. C. Rose'44, J. H. Ruckman'10, J. C. Schroeter'30, J. H. Schulman'39, B. D. Smith, Jr., '48, G. H. Snyder'34, J. H. Sprague, Jr., '43, N. P. Stathis'29, W. B. Stewart'31, F. I. Strabala'48, M. E. Taylor'42, W. S. Thomas'15, H. H. Thompson'13, W. E. Thomson'38, R. K. Thulman'22, F. W. Turnbull'30, F. P. Upton'16, H. E. Weihmiller'25, and W. E. Wentworth'16.

The Society was addressed on February 2 by Reginald E. Gillmore, Vice-chairman of the National Security Resources Board. Mr. Gillmore, internationally recognized figure in industry and government planning, discussed his board, the job it has been given to do and the philosophy on which the task is being tackled. Specialization and co-operation, stated Mr. Gillmore, have characterized not only successful nations in history, but even animals and cells in the lower forms of life. To succeed, a species or race must achieve a degree of specialization but must also keep in balance with it an equivalent degree of co-operation. If the balance is not achieved, other species or nations with a better balance will take it over. For example, ancient Greece succeeded in developing a marvelous nation while co-operation was adequate. But success led to complacency and lack of co-operation until enemies with co-operation under dictatorship conquered the Greeks. The United States must, said Mr. Gillmore, provide for the utmost co-operation to ward off enemies. This program has been started abortively a number of times in the past decades, but only in the National Security Resources Board has the Congress provided the necessary legislative foundation for an effective organization. All government departments before the National Security Resources Board existed to foster and develop the welfare of a particular group. The N.S.R.B., on the other hand, is for the purpose of advising the President on such broad subjects as the most effective use of national resources and industrial resources for military and civilian use, maintenance and stabilization of the national economy, unifying the Federal Government in time of war, establish reserves of strategic and critical materials and their conservation. This sort of agency and planning is vital, stated Mr. Gillmore, because war another time will probably not follow a warning period as we have known before. He said that we very nearly lost World War II at least five times. Only the military ineptness of the German political command saved this

country from defeat. We must forestall such a hazard another time by adequate planning.

Mobilization of manpower to make most effective use of rare skills is a basic objective of the N.S.R.B. Management is recognized by the Board as a skill by itself which can be transferred from one industry to another. Best use of management is a plan of the Board. Other problems receiving attention from the 350-person organization include financing of plant appraisers for war purposes, alternate products to which plants can be adapted, and maximum use of existing government agencies to do work contributory to the Board's task. Adequate planning now while there is time, said Mr. Gillmore, will do much to avoid the confusion caused by the independent operations of the 137 temporary World War II government agencies should another emergency arrive. He believes that the functions of these agencies could be accomplished by 15 agencies properly coordinated by N.S.R.B. The Society was told that life on this planet is obviously planned. Mankind has studied for centuries to discover the nature of the plan of which evolution is a part. Specialization and co-operation appear to be the winning combination and the National Security Resources Board is basing its operations upon the fostering and development of this basic tenet.

Present were: G. L. Arnold'30, H. M. Baxter'17, A. D. Beidelman'15, A. E. Beitzell'28, M. A. Bird'47, A. F. Bird'30, J. R. Bloom'30, S. J. Cole'26, L. W. Conant'21, W. L. Cook'03, F. H. Copeland'18, J. G. Crane'90, G. B. Devey'46, I. M. Dow'30, L. K. Downing'23, J. A. Furer'05, L. J. Grayson'19, O. B. Hartman'43, A. S. Heyser'26, H. D. Hoffman'27, G. R. Hopkins'22, T. A. Hurlbut'28, J. R. Kalman'33, E. F. Kriegsman'05, B. E. Lindsly'05, W. H. McAlpine'96, Richard McKay'21, H. D. Manuelian'18, W. H. Martin'11, Mrs. O. C. Merrill, F. W. Milliken'04, G. D. Mock'28, H. C. Morris'00, N. C. Nelson'30, John Nolen, Jr.'20, E. L. Osborne'14, W. G. Peck'40, J. A. Plugge'29, W. D. Rowe'24, J. H. Ruckman'10, M. P. Smith'19, W. R. Sherman'28, M. O. Soroka'26, F. Stapleton'24, N. P. Stathis'29, G. W. Stone'89, H. B. Swett'25, F. W. Turnbull'30, F. P. Upton'16, H. E. Weihmiller'25, W. E. Wentworth'16, R. W. West'32. — ALBERT F. BIRD'30, *Review Secretary*, 5070 Temple Hills Road, Southeast, Washington 20, D.C.

CLASS NOTES

• 1884 •

Information concerning the death of Theodore W. Robinson has been received from Lonsdale Green'87 who kindly sent the newspaper clipping from which we quote as follows: "Theodore W. Robinson, retired vice president of the Illinois Steel company and chairman of the board of the Ditto corporation, died . . . while

vacationing in Palm Beach, Fla. He was 86. Mr. Robinson, who retired in 1932, had been prominent in the steel industry for 47 years. After his retirement from the steel company he became associated with the Ditto company, manufacturers of duplicating machines. He graduated from . . . Technology and first worked with the Joliet Steel company. In 1889, he joined the Illinois Steel company and was put in charge of its blast furnace operations in Milwaukee. A few years later he became general manager and then vice president. For many years Mr. Robinson had been a trustee of Northwestern university; the John Crerar library, the Science museum, and Passavant and Wesley Memorial hospitals. He was a governing member of the Art institute and an official in several musical organizations. For several years he was a member of the Chicago School board and was chairman of the committee to straighten the Chicago river and a member of the advisory committee for beautifying Chicago under the Burnham plan. He was a member of the Dawes commission. . . . Surviving is his widow Frances; a daughter, Mrs. Ronald P. Boardman; two sons, Theodore W. Jr. and Sanger, and three grandchildren."

• 1888 •

It is our sad duty at this time to report to the Class the death of Bertrand R. T. Collins on March 3. Stanley W. Hyde'17 very kindly sent us a clipping from the *Portland Evening Express* from which we quote as follows: ". . . Mr. Collins was born at York Beach, Me., in 1866. He attended Fryeburg Academy and was graduated from . . . Technology. . . . He served with the navy during the Spanish-American War. For many years he and his family spent their summers on Chebeague Island. Surviving are his widow, Katharine Greer Collins; his daughters, Miss Dorothea of Princeton, N.J., Mrs. Katharine Mayer of Beaver Dam, Wis., and Mrs. Sarah Hughes, Utica, N.Y.; and a sister, Miss Viola T. Collins, Waldo, Fla." — We also deeply regret to inform you of the passing of Sanford E. Thompson on February 25 in Phoenix, Ariz. Funeral services were held in the Newton Highlands Congregational Church, Newton Highlands, Mass.

The following notes were submitted by your faithful Secretary a few weeks prior to his death: President Ned Webster is looking forward to his usual vacation at his summer home in Holderness, N.H. — Ralph Sweetland plays golf every day that the weather is suitable. He is one of the best players in the Class. — Walter Silsbee of Cambridge, Mass., is still adding to his collection of pipes which is now well above the century mark. — Charlie Sabine of Hammond Street, Chestnut Hill, has the best flower garden in Duxbury at his summer home there. — Johnnie Runkle has a new summer home in Cumberland, Maine, just east of Portland. — Charlie Merrell has transferred his year-round home from Cincinnati, Ohio, to Dunedin, Fla. — George Hamblet of Lawrence, Mass., still has the most children and grandchildren of anyone in the Class.

• 1890 •

The 1948 Alumni Register includes in our list of members the following for whom we have no address and concerning whom the Secretary has no notes or information: A. S. Bradley, Jr., A. V. Bunker, A. E. Chase, H. W. Curtis, G. W. Dodd, W. J. Dore, G. Eaton, C. R. Edgerton, G. A. Gilman, H. W. Haddock, J. P. Heywood, F. S. Hollis, G. Hubbard, D. D. Kearns, G. C. Landis, W. McK. Lorenz, G. B. Loynes, E. R. Maker, M. R. Mann, W. R. Marshall, C. E. Martin, E. J. Meyers, F. C. Moody, S. A. Moss, G. L. Parmelee, M. K. Remick, A. Sherman, F. C. P. Thomas, W. F. Wells, N. B. Wilbur, W. D. Willes, G. M. Woodward. The Secretary will be pleased to receive any information about any of them.

Will Creden writes that he has been very ill for the past year and has been obliged to decline joining the Committee on Financing Development, which is a great disappointment to him as he has always been active in support of M.I.T. — GEORGE A. PACKARD, *Secretary*, 53 State Street, Boston 9, Mass. HARRY M. GOODWIN, *Assistant Secretary*, Room 5-213, M.I.T., Cambridge 39, Mass.

• 1892 •

Arthur Ober and the Secretary again represented the Class at the midwinter alumni gathering at Walker Memorial on February 5, and listened to a very interesting program headed by Dr. Compton and our new President, James R. Killian, Jr., '26. Robley D. Evans of the Physics Department entertained us with an outline of applications of atomic energy in the medical field.

The Secretary received recently a letter from George Rowell of Philadelphia containing notice of the death of Laurence B. Manley at his home in Philadelphia on Friday, February 11. Manley graduated with us with the bachelor's degree in Civil Engineering. He was born in Brighton, Mass., on March 12, 1870, and entered the Institute after graduation from the English High School in Boston. He accepted a position first with the Brookline Gas Light Company, and from 1896 to 1917 was an engineer with the Boston Transit Commission. Under that Commission he had general charge of the layout and construction of the Boylston Street Subway. In 1917 he went to Philadelphia for a position with the Philadelphia Department City Transit where, as division engineer, he had charge of the final completion and opening of traffic of the Frankfort Elevated Railway. In this department he was connected with the administration of subway construction contracts aggregating some 125 million dollars. In connection with his work in Philadelphia, he was office engineer for the Delaware River Joint Commission from 1933 to 1936 in connection with the construction of a spur subway line to Camden. Work with the City Transit was suspended in 1938 but later revived and Manley returned with them, serving from 1946 to 1948 when he finally retired from active work.

He was for many years a member of the American Society of Civil Engineers,

a member of the Engineers Club of Philadelphia, and a member of the Unitarian Church in Germantown, Pa. In 1900 he was married to Florence Irene Everett who died on June 4, 1932. In March, 1936, he was again married to Mary Alice Gibbons who survives him. He is also survived by four children, John Howard Manley, Mrs. Thomas Phillips, Mrs. Irving Westervelt, and Mrs. Joseph Reeves, and several grandchildren.

Rowell reports that he is well and retired from active work last May after about 32 years with Day and Zimmermann, Inc. He says he doesn't seem to have much to do but manages to keep busy. He frequently contacted with Manley in recent years and states that they came to Philadelphia at approximately the same time. His present home is at 4823 Beaumont Avenue, Philadelphia 43, Pa. — CHARLES E. FULLER, *Secretary*, Box 144, Wellesley 81, Mass.

• 1895 •

James Thomas Reid McManus, I, of 250 Bonaccord Street, Moncton, New Brunswick, Canada, passed away at his home on November 11, 1948, after a brief illness. He was born in Memramcook and graduated from the St. Joseph's University and Technology. Mack, as we always called him, started with the Boston Bridge Works as an estimator and then became a steel inspector on the Boston subway until 1897. Leaving the East he went to British Columbia with the Canadian Pacific Railway as a rodman on construction of the Crow's Nest Railway, and in 1899 returned to Moncton to join his father and brother in the contracting business under the name of John W. McManus Company, Limited. This well-known firm carried out very large undertakings including construction of sections of the National Trans-Continental Railways, the right of way for the transmission lines of the New Brunswick Electric Power Commission from Musquash to Moncton, the original McNutt reservoir for the City of Moncton and the subsequent raising of both reservoirs. Reid always had taken a deep interest in educational matters and was a member of the Moncton Board of School Trustees for about 30 years. His experience in business and construction made him one of the most valuable members of this board. The Moncton Hospital also received his valuable services for many years as a member of the board of trustees. He was active in the public life of the province, being elected in 1920 to the New Brunswick Legislature, representing his constituency until 1925. He was a devout member of the Roman Catholic Church and an outstanding layman of St. Bernard's parish, and in the Archdiocese of Moncton. His notable services were rewarded by the late Pope Pius XI, when in 1937 His Holiness conferred on him a Papal Medal. He was also a charter member of the Moncton Council, 1310 Knights of Columbus. Reid was also a keen sportsman, and curling was one of his favorite sports. His club connections included the Moncton City Club, Board of Trade, and the Canadian Club. Those of us who still linger on will miss him at our reunions.

J. Foster White, V, who was with our Class during 1892-1893, and who has been incapacitated for some years, can be reached at the Hotel Vendome, 160 Commonwealth Avenue, Boston, care of Mrs. J. Foster White. — We have learned recently that Mrs. Robert Greenwood (Alice Mabel Macomber), who was with the Class during 1891-1892, passed away during 1945. — Regretfully the Class begs to extend their deepest sympathy to Samuel P. Hunt, VI, of Manchester, N.H., in the loss of Mrs. Hunt, who passed away on January 18. — Eddie and Mrs. Alden are on their regular winter trek through Florida, and are now sojourning at Daytona Beach, and then to Clearwater and St. Petersburg "for the duration." — Andrew D. Fuller, who has faithfully served as Class Representative on the Alumni Council, has been reappointed for a term of five years. — LUTHER K. YODER, *Secretary*, 69 Pleasant Street, Ayer, Mass.

• 1896 •

The following letter was received from Mrs. Albert Cluett: "Words seem so inadequate, I fail to express what is in my heart. My sons and I are very grateful for your kind letter and for the love and esteem Albert's many friends held for him, particularly those of M.I.T. The thoughtfulness and kindness shown to him the last few months, we shall never forget. Our deep appreciation for your thoughts of us and your kind sympathy."

Those of the Class present at the Mid-winter Meeting of the Alumni Association held on February 5 were: Damon, Davis, Driscoll, Grush, Howard, Rockwell and Rundlet. Perry Howard brought a senior honor student of Watertown High School, who will later enter the Institute, as his guest. Harry Baldwin could not leave home because of his wife's serious illness. Reverend Partridge is still at the Storrow House, unable to go out at night. Ed Mansfield: "Sorry, but no can do." Ralph Henry, not up to it yet, but making slow progress toward full recovery. Others were notified but could not make it. The cafeteria steak dinner was good and easy on the pocketbook. We felt the loss of Charlie's presence for the first time in joint session, and we *did* miss him. We discussed Fred Damon and his new pro-tem job. He qualified with the Boston group and will, no doubt, receive equal support when we meet in New York. All in all, it was a very good get-together, even if James Driscoll did feel somewhat restrained (plaster jacket). The new organ donated by the Class of 1918 added much to the singing of M.I.T. songs, which were injected here and there between the speeches by Dr. Compton, President Kilian'26 and Professor Evans. The showing of a full-color newsreel of the outstanding events of M.I.T., 1948, was given great acclaim. Dr. Compton honored us by exchanging personal greetings at our table.

Fred Damon and the Secretary stormed John Tilley's office at 100 East 42d Street, New York, about 5:30 P.M. on February 17 and, following a sober conference, adjourned to the President's Tavern where we were soon joined by Bakenhus, Freedman, Hall, Sager, Stevens and Trout. A

standing, silent toast in honor of "our Charlie" was our first order of the day. We all exchanged happy reminiscences of our leader and felt that he was nodding his approval. We all gave accounts of ourselves and reported for some who were unable to attend. The Secretary presented various subjects discussed at the recent Boston meeting and the following suggestions were to be discussed at a called meeting on April 2 at the Engineers Club: 1. Formal election of the Secretary-Treasurer; 2. Formal election of an Assistant Secretary (Damon has been the choice); 3. Consideration of our class scholarship fund; 4. Pass on resolutions as to what event would determine the transfer of 1896 funds to M.I.T.; 5. How to best support the Development Program at the Institute; 6. Explore the various forms of donations acceptable to the M.I.T. Corporation; 7. We realize that this drive for the new building program is most important for funds are in present need. Let's put '96 right up there as a standard target at which to shoot. — Fred Damon and your Secretary wish to express our appreciation of the warm welcome we received at the New York 1896 February 17 dinner. It is a great tribute to our loyalties, and may we all live to enjoy many another. New addresses: Augustua J. Bowie, 2513 Octavia Street, San Francisco, Calif.; Myron L. Fuller, 4 Rhode Island Avenue, Ft. Meyers, Fla.; Charles G. Howe, 1240 North Limestone Street, Springfield, Ohio. — JOHN A. ROCKWELL, *Secretary*, 24 Garden Street, Cambridge 38, Mass. FREDERICK W. DAMON, *Assistant Secretary*, 275 Broadway, Arlington, Mass.

• 1897 •

Charles H. Eames, VI, President Emeritus of the Lowell Textile Institute, died at his home in Billerica, Mass., on January 29, aged 74 years. After graduating, he was employed for eight years by the Stone and Webster Company of Boston. In 1905 he joined the faculty of the Lowell Textile School as instructor in mathematics and electrical engineering. Later he was appointed secretary to the principal, William W. Crosby. In 1907, on the retirement of Mr. Crosby, he was made principal and in 1908 was chosen president; the institution being known thereafter as the Lowell Textile Institute. He retired in 1945. To quote a writer in the *Boston Herald*: "Mr. Eames guided the institute during its formative years and was largely responsible for its widening sphere of influence in the field of fabric technology and chemistry, improving the school's standard so that in 1935 it was granted authority to confer master's degrees in science, textile engineering and textile chemistry. Under his direction it became the largest textile school in the world."

For 35 years Mr. Eames was town moderator of Billerica, and was noted for his fairness in conducting the town meetings. He was a past president of the Billerica Library Association, and of the Billerica Historical Society, a trustee of the Lowell General Hospital and of the Rogers Hall School for Girls, and vice-president of the Central Savings Bank of Lowell. He was a member of the Ameri-

can Institute of Electrical Engineers, the American Society for the Advancement of Science and of the National Association of Cotton Manufacturers. He was a 32d degree Mason. Charles was a very likable fellow and attended all the outings and reunions of the Class. His presence will be greatly missed at future gatherings. We spent many happy hours with him at the 50th anniversary reunion at Osterville in 1947 and at the several events that were held at the Institute following the reunion. He left no immediate relatives.

H. Archer Clark, II, died at his home in Lee, Mass., on January 9, aged 73 years, following a short illness. He had lived in the town for 51 years. After graduating, Archer became associated with his father in the machine shop located in East Lee, and the firm's name was the Henry C. Clark and Son's Machine Company. Following his father's death in 1910 he took over the business which was mostly concerned with the paper mill trade and which later became the Clark-Aiken Company. Mr. Clark retired in 1941. For a period of 50 years, Archer was a member of the Congregational Church choir, and he was a noted soloist and member of the choir quartet. He was vice-president and director of the Lee National Bank, vice-president of the Lee Savings Bank and prominent in many of the civic affairs of the town. He leaves one son and one daughter. He was always an active member of the Class and attended all class reunions. In 1947 he was present at the 50th anniversary reunion at Osterville and also attended the other alumni functions that were held at the Institute later that week. He contributed much to the success and pleasures of those events.

Two members of the Class have been taken from us in the same month, and both were with us at Osterville in 1947. In the short space of less than two years, five men who were at Osterville in 1947 have passed on: Hubbard, Sumner, Hooker, Clark and Eames; passings that bring regrets and sadness to us all.

Word has been received with no further details at present of the death on January 21 of James L. Fyfe, IV. Mr. Fyfe resided at 316 South Euclid Avenue, Oak Park, Ill. We have also learned of the death on June 30, 1918, of Bertram C. Ransome, II. — JOHN A. COLLINS, JR., *Secretary*, 20 Quincy Street, Lawrence, Mass.

• 1898 •

After sending the class notes last January for the March issue of *The Review*, your Secretary left Boston for a winter vacation in Florida. This was due to the initiative and invitation of our irrepressible and delightful world-traveling classmate, George Cottle. In the course of the trip we spent two weeks at Hotel Lake Alfred, the winter home of Arthur and Jean Blanchard, who did everything imaginable to make our visit in the heart of the Florida citrus industry enjoyable and memorable. We also had pleasant calls on the Tuckers at Daytona Beach, the Babsons at Mountain Lake; and we called at the Hurters' in St. Petersburg but they were out riding. Better luck next

time, Charlie! We are now driving north and these notes are being written early in the morning from a tourist court in Georgia. George will be up soon and knocking at the door, for we are making an early start. He plans to cover 400 miles today to reach Danville, Va., our next overnight stop.

While in Lake Alfred we received a card from Bob Wallace, mailed from Charleston, S.C., and forwarded from Boston, which reads: "We have taken a house in Charleston for three months and like it very much. Address 83A Church Street, Charleston, S.C." — If you have never tried a winter vacation in Florida, I can heartily recommend it, but be sure to pick a month when the numerous orange groves are filled with golden fruit and the gorgeous Florida flowers are blooming. — EDWARD S. CHAPIN, *Secretary*, 463 Commercial Street, Boston 13, Mass. JOSEPH C. RILEY, *Assistant Secretary*, 9 Pond View Avenue, Jamaica Plain, Mass.

• 1899 •

The news this month is mostly of a type your Secretary is loath to report. — Ralph Loud, I, of Arlington, Mass., is a patient at the New England Deaconess Hospital, convalescing from a serious operation.

Arthur E. Hoxie, I, of Laconia, N.H., died in June, 1948, after an illness of approximately one year. Arthur was born in Newburyport, Mass., later moving to Everett, Mass. After graduating from the Institute, he worked in Louisiana, Arkansas and Nebraska, before returning to New England. After an experience as assistant engineer on construction work in Maine, he became one of several engineers to inaugurate Forest Service surveying in the White Mountains of New Hampshire. Later, following seven years' work with the Boston and Maine Railroad, he became engineer in charge of grounds at Wellesley College, 1925-1933. Arthur then inaugurated Forest Service work for the state of Vermont. From 1937 until his death he was in private practice in Laconia, N.H. He is survived by his wife and by a brother located in Lexington, Mass.

David C. Mills, IX, died on November 2, 1948, at his home in Darien, Conn., after an illness of two years. David, born in St. Louis, Mo., received his preliminary education in California and at Phillips Andover Academy. In 1901 he secured a position with the *Fur Trade Review* and the *Hat Review*, subsequently becoming editor of their publications. Resigning in 1911 he took a leading part in the organization of the Association of Fur Manufacturers. In this position from 1911 to 1923, he did much to advance the interests of the fur trade. In 1923, he took an active part in the formation of the National Association of the Fur Industry. He remained with that organization as general director until its dissolution in 1932. As an authority on fur-bearing animal life, he was appointed head of the fur-bearing animals subdivision of the Wild Life division of the National Conference on Outdoor Recreation in 1925. He is survived by his widow, Laura Stallnecht, and three sons.

George R. Heckle, III, died on January 17, 1949, at the St. John's Riverside Hospital in Yonkers, N.Y. He was a native of Wellesley Hills, Mass. For ten years after graduation he worked successively for the Rutland Canadian Railroad, the Baltimore and Ohio Railroad and for T. A. Gillespie Company, contractors. In 1909 he became associated with the engineering firm of Stone and Webster, for which he laid out electric railway lines in Florida. Later, as vice-president and engineer of the Amberson Hydraulic Construction Company of Canada, he directed several power projects in Canada. During World War I, Mr. Heckle prepared a number of concrete shipways for the government at Hog Island. After the Armistice he opened an office as a consulting engineer at 120 Broadway, New York. In 1922 he was in Canada again, carrying out hydroelectric developments for the Frederick Loomis Company. Mr. Heckle began the construction of a nickel refining plant in Cuba for Ford, Bacon and Davis of New York in 1943. On the completion of this task he returned to his private engineering practice in New York. He was a member of the American Society of Civil Engineers, the Engineers Institute of Canada and the Corporation of Professional Engineers of Quebec. His widow, Virginia Lorini Heckle, survives.

New addresses: Henry F. Leavitt, I, from 22 Fountain Street, to 6 Alden Avenue, New Haven, Conn.; Haven Sawyer, II, from Washington, D. C., to 840 Broadway, Bangor, Maine; Carroll W. Brown, I, from Arlington, Va., to 1890 East 97th Street, Apartment 5, Cleveland, Ohio.

On the 17th of February, or a half month after the questionnaire about the 50th reunion was sent out, 40 replies had been received. Of this number, 24, or well over one-half, replied definitely that they planned to attend the reunion; 4 more hoped to; 9 said no and the rest were undecided for one reason or another. One classified in the latter category, Loud, was on the point of going to a hospital for a serious operation. On the question of a Boston hotel versus a country club as headquarters, 15 voted for the former and seven for the latter, with 15 not voting. If you have not already responded to the questionnaire, please do so *as soon as possible* so that the reunion committee may have the benefit of your reply in planning the program. — BURT R. RICKARDS, *Secretary*, 381 State Street, Albany, N.Y. MILES S. RICHMOND, *Assistant Secretary*, 201 Devonshire Street, Boston, Mass.

• 1900 •

Eight members of the Class, with two guests, met at Walker Memorial for the Midwinter Meeting on Saturday, February 5. They were: Fitch, Jackson, Lawley, Leary, Richardson, Russell, Silverman and the Secretary. As Alumni were invited to bring their sons or neighbors' sons, Leary brought his son, Jack, and Jackson had as a guest, Richard Lovell. We had a table by ourselves and thoroughly enjoyed the excellent cafeteria dinner and the social hour before the exercises. The addresses by Dr. Compton and President Killian were interesting and informative. The paper of the evening was on "Peace-

time Atomic Energy" by Dr. Robley D. Evans and was most lucid and instructive.

We were all delighted that George Russell could be with us again after his long illness. He seemed to be in excellent health and still looks to be the youngest member of the Class. — Stanley Fitch announced the good news that he was married on November 27, 1948, to Mrs. B. F. W. Russell, widow of a member of the Class of '98. The wedding took place in Brooks Chapel of Trinity Church. They are now living at 100 Goddard Avenue, Brookline. We are all very happy for Stanley and extend our heartiest good wishes to them both.

The sudden death of Ed Bugbee on February 2, which was noted in the Institute Gazette in the March Review, came as a shock to us all. We had received a letter from him dated January 21, less than a fortnight previously, in which he said: "I am afraid I will have to pass up the February 5 meeting but give my regards to the 1900 'boys.' Just now I am regretting that I cannot go to the 1949 annual meeting of the A.I.M.E. to be held in San Francisco next month. This, you will recall, commemorates the 100th anniversary of the discovery of gold in California." We understand that Ed's death was almost instantaneous from a shock which overcame him on the streets of Boston.

In his letter, Ed sent us one from D. S. Johnson relating some of his experiences on trips through the West. Among other things Dan said: "To Arizona to hibernate is the idea in my own mind. Right now I can't do it on account of a great many small business ends, but for years I thought I would go to Arizona for the winter, or possibly Florida, but have never made the right combination to do so. Last September my friend, Selvage, from Newark, N.J., and I, after some work here in the summer, left for Las Vegas, then to Zion Park and Bryce Canyon. Back tracked to Jacob Lake and east to the Navajo Bridge over the Colorado and down to the south rim of the Canyon where we put in two days at El Tovar. Next, south to Williams and west to Kingman for lunch and then to Boulder City and the Dam. Next day to Las Vegas where we took in the sights and then Selvage took a plane for New York and I started for Tonopah. Two years ago we did a similar jaunt, but north to Reno, Mt. Lassen, Crater Lake, Klamath Falls, Grants Pass, Crescent City, Eureka and down through the redwoods to Berkeley and San Francisco from where he flew to New York and I drove over the Donner Summit to Reno and here. Both these trips were mainly landing and taking off for a new piece. I think one should stop at some interesting place and spend a few days, but what kind? An old mining camp like Calico or Searchlight? Phoenix and Tucson are expensive in the winter, but after reading my copies of *Arizona Highways* I am sure there are hundreds of places where one could rusticate in the sun instead of wearing a fur coat here. Temperature last night here, eight below zero."

The Boston Post of January 12 carried an article with a scare headline announcing that Levi B. Jennings, I, had won a prize in a last line limerick contest.

The limerick for which his last line won the prize was: "A spider who lived in Bombay/ Was walking the woodlands one day/ When along came Miss Moffet/ And sat on a tuffet/ And said to his Nibs, 'Don't get gay.'" This article goes on to say: "Employed by the Irving-Casson Company of 37 Newbury St., Back Bay, for the past 47 years, a firm that has decorated the interiors of some of the finest homes in the country, Jennings has always been an admirer of anything beautiful and that includes words that are put cleverly together. Jennings reveals that for the past 125 years, the Jennings family have lived on Glen Rd. in Wellesley Farms, his great-grandfather, his grandfather and his father before him, occupying residence on that famed Wellesley street. The Jennings estate at one time was composed of over 150 acres and was one of the best known farms in the East. Jennings graduated from M.I.T. in 1900 where he majored in Architecture and Civil Engineering and started his career by working for \$8 a week. . . . The firm for which Jennings works has done the interior work at St. Patrick's Cathedral in New York and in other famed edifices the country over, including the Mellon home in Pittsburgh and for the Schrafft candy concern here in Massachusetts." — ELBERT G. ALLEN, Secretary, 54 Bonad Road, West Newton 65, Mass.

• 1901 •

A note from Russell Putnam reads: "Retirements seem to be the order of the day with 1901 men. Mine started the first of this month. Mrs. Putnam and I plan to keep on living right here, and in unfavorable winter weather we shall hibernate. We will stock up on canned and frozen food to last until the next thaw. We hesitate to go down south as it is too far away from our two children and six grandchildren. I am an active collector of clocks and watches which keeps me from complete stagnation. I had a letter from Ed Belcher recently. He has the same hobby. As his name is on your missing list, I am enclosing his card. I see Ed Davis occasionally. When last seen he had not carried out his threat to swear off smoking." You will remember that Russell was with the Waterbury Clock Company for many years (now U.S. Time Corporation) where he was director of engineering and lately assistant to the President. Ed Belcher's card states that he is a dealer in antique clocks and repairs clocks at 12 Lewis Street, Portland, Maine.

In answer to a query, Everett Pendleton writes in part: "What do I do all day? Readin', riting and 'rithmetic, principally. Amuse myself with genealogical researches. A very interesting subject with which to kill time. Haven't run back all my ancestral lines. So far have corralled four who came over with Brewster (in the *Mayflower*). Have a work about ready for the printer now that will run up to 450 pages, and others pending."

I report with regret the death of Charles A. Mace on January 3, 1949. The following obituary is from a New York City newspaper: "Charles Austin Mace, secretary of the Synthetic Organic Chemical Manufacturers Association of 41 East

Forty-second Street since 1927, died of a heart attack on Monday night at his home, 4051 Seton Avenue, the Bronx, at the age of 68. Trained as a chemical engineer, Mr. Mace had been employed by several large corporations in this field before he became affiliated with the association. From 1922 to 1927 he was field sales manager for the Tower Manufacturing Company. After his graduation from . . . Technology in 1901, Mr. Mace was employed by the Dominion Textiles, Ltd., of Canada and subsequently by Armour & Co., the Badische Company and Butterworth, Jordan Corporation of Philadelphia. He was a member of the Chemists' Club, the Dry Salts Club of Boston and the University Club of Washington. He leaves his wife, the former Miss I. L. Ferdinand of Chicago, and two daughters, Mrs. Nan Vaughan and Mrs. Alice Vaughan, both of New York."

We were pleased to receive greetings of the Holiday Season from Joe Evans with the following note: "I have been very busy getting my home ready to rent. It was lonesome living alone in a nine-room house so I took a small apartment and am getting along nicely. I keep active attending weekly two club luncheons, concerts, and various lectures at the famous Joslyn Memorial, and active in First Baptist Church matters. I am designing a four-and five-room bungalow that can be built for \$5000 and \$6000 without land cost. May build one for myself in the mountains of Colorado and near Tucson, Ariz. Then I will have places to go as the urge suits me. But I'll not give up my motor trips to New England. Couldn't spare the time for a motor trip last summer so went to Montreal, and, with a friend, motored to the White Mountains and Wells Beach, Maine, for a two-weeks' stay. I surely enjoy your letters for the '01 class news. It's wonderful you have such a perfect pal as a wife to help you so nicely."

Here, in part, is a recent letter from Roger Wight: "Apologies are very much in order. However, I believe you will accept them for I was in the Marlboro Hospital when your letter of May 4 was received and was just commencing to get settled in my new retirement home when your nice post card of September 2 was delivered. So, some way my pending correspondence became mislaid and I am only now getting up to date. As a matter of fact, I did not get out of the hospital until June 9 and after we got moved in down here I tried to do too much and had a relapse. Since then I have had to be satisfied not to do very much. It's definitely annoying for I'd hoped to do quite a lot of golfing this past fall (my place adjoins an easy nine-hole golf course), but had to be satisfied to wait until next spring when I expect to be feeling definitely very ambitious again. My place is for all year and is fully insulated and heated, for the Mrs. and I are hardly planning to go south even in the winters. We like it here so much and have met such a lot of fine neighborly people. Have a brother-in-law, Frank Mitchell, of M.I.T. '02 (really '01 as that was originally his Class) who lives in Ayer Lane (see map) and more and more retired people are moving here all the time." Roger lives on Miles Street in Harwich Port, Mass.,

which, as you know, is on Cape Cod.

Charlie Bittinger delivered a lecture on November 17 at the National Arts Club, New York City, on the Atomic Bombs at Bikini. He invited us to the lecture but, unfortunately, your Secretary was out of town. However, Mrs. Peterson attended and reports that the lecture was very interesting and instructive and enthusiastically received by the audience. The talk was illustrated with Kodachrome motion pictures which added much to the lecture. The pictures of the explosions were both awesome and beautiful. Afterwards, Mrs. Peterson had the opportunity to talk with Captain Bittinger for a few minutes about Duxbury, Mass., and other topics of mutual interest.

Bob Williams reports: "January 1 I retired from the Submarine Signal Company having reached the age limit of the company's retirement plan. I have not made any plans for the future as yet. For the present I am enjoying taking it easy. During the 43 years at Submarine Signal I have taken out over 40 patents and have had a most interesting job. I have had many interesting trips in the United States, Cuba and two trips to Europe where I visited England, France, Germany and Italy. Enclosed is an article from the Boston *Herald* regarding the farewell dinner which the company gave me. I am looking forward to our 50th reunion which will be here before we know it. Perhaps I can see you sometime this summer in Plymouth now that I will have plenty of time."

Here is the article to which Bob refers: "More than 200 employees of the Submarine Signal Company at 160 North Washington Street attended a testimonial yesterday to Robert L. Williams, senior engineer and employee of the concern for 43 years, and Greg Vaux, who until his retirement a year ago was special installations supervisor. Both men, noted for their work in the furtherance of safety at sea and naval defense, were presented with gold watches. Williams, who also is about to retire, has taken part in all of the developments which the Submarine Signal Company has promoted, from the simple bell and microphone receiver to the highly complex submarine detection and radar apparatus, which is still held secret under national security regulations. Williams and Vaux worked together on all new developments of the concern. Williams now lives with his brother-in-law and sister, Mr. and Mrs. Henry C. Ring, on Waban Hill Road, Chestnut Hill. Among those attending the presentation ceremony were I. C. Clement, vice-president of the concern; Lawrence K. Marshall, chairman of the board of the Raytheon Corporation; Wallace Gifford, executive vice-president of Raytheon and the Submarine Signal Company; C. F. Adams, Jr., president of both concerns; A. Wise, resident Naval inspector, and James Wright, treasurer of Submarine Signal." — GUY C. PETERSON, *Secretary*, 788 Riverside Drive, New York 32, N.Y. THEODORE H. TAFT, *Assistant Secretary*, Room 3-282, M.I.T., Cambridge 39, Mass.

• 1902 •

John Marvin in joining up for our 50th reunion writes in part as follows: "I fully

planned to be on hand for our 45th but when the important week arrived I was up in Alaska in the middle of a three months' vacation, so missed being with you all. The good wife and I just got into the car on April 15 and took a leisurely trip around the United States, visiting 16 of the national parks in 26 states. Also a side run into Mexico. Went to Vancouver and left the car and took the wonderful 'inside passage' via C.P.R. Steamship to Alaska and return. Came home via the Canadian Rockies. Averaged 145 miles a day, so you see, we took it easy. Stopped where we liked and pushed on when we found the places uninteresting. Had such a good time we plan to do a return trip this summer for two months in Colorado, Arizona, and Utah. But 1952 is reserved, in June anyway, for Cape Cod and Cambridge."

From a clipping from the Quincy, Mass., *Patriot-Ledger* we learn that Archibald H. Briggs, who was associated with our Class for two years, has been a leader in the Boy Scout activities of that city for some 30 years, receiving in 1936 the high honor of Silver Beaver, the highest Scout honor which an adult can receive. He is still actively interested in the Scouts and devotes his spare time to their welfare. Briggs has been with the Massachusetts State Highway Commission since 1911 and is attached to the Middleboro office. — Also, by a clipping from the *Reporter*, Foxboro, Mass., we learn that Irving W. Reynolds, better known to us as Ike, has been with the Foxboro Instrument Company for 40 years and has become a charter member of the company's 40-Year Club.

Our Chicago Vice-president, John M. Fitzgerald, was made an honorary member of the Chicago Engineers Club at a luncheon given him on January 20. — Unfortunately, for himself, your Secretary could not attend the Midwinter Meeting on February 5, but the Class was well represented by Dan Patch, Bob Williams, Fred Hunter, Porter, and Mahar.

A recent wedding of interest to the Class is that of Mrs. Mary C. Frenning and Bert Sherman, which took place on February 12 in Belmont. — BURTON G. PHILBRICK, *Secretary*, 246 Stuart Street, Boston 16, Mass.

• 1904 •

Cards were recently sent to all on our class mailing list announcing our 45th reunion at East Bay Lodge, Osterville, Mass., June 24-June 26. We hope at that time to make some preliminary plans regarding our 50th in '54. Replies are still coming in every mail and it looks as though we might have a nice party. The following hope to attend but several of them are doubtful: Ager, Anthony, Baton, Boggs, Bouscaren, Chapin, Cunningham, Curtis, Downes, Eager, Edgecombe, Elwell, Farrell, Fellows, Foster, Haynes, Hayward, Holbrook, Holcombe, Homer, Kendall, Langley, Munster, Parker, Peiler, Porter, Richardson, Rockwood, Russell, Smith, Sutton, Sweetser, Whitaker, Willard, Wilson. If your name is not on this list and you expect to attend, it is possible your reply came after these notes were sent to the Review Office. If you sent a

no reply and can change your mind, let us know. Requests for final commitments will be sent the last of May to those who have shown interest.

Some news items have come in with the replies. Roy Mailey writes that he is retired and living in North Andover, Mass., but is too crippled to attend the reunion. George Briggs says: "Sorry to miss it but Mrs. Briggs and I are booked for an extended trip to Europe this summer. Will try to make it for the 50th which will be a real milestone. Greetings and best wishes to the boys." Why not send us some items about your trip, George, to put in the class notes? Holcombe expects to attend and says he saw Guy Palmer and his wife recently in Washington. He said Palmer hoped to attend but his card has not come in yet. Arthur Smith writes: "I cover the United States and Canada twice a year in calling on our licensees and also do a certain amount of patent work. Rarely run into any '04 men." Bill Whitaker is retired but recently made an extended trip covering 39 states. Shorty Holbrook writes: "Glad you are having a 45-year reunion. Some of us may not be around to attend the 50th. I have been trying to resign as dean of the School of Engineering and Mines here in Pittsburgh for two years without success. If I have luck this year I plan to be there with Mrs. Holbrook." Arthur Downes has retired after 42 years with the National Carbon Company. Dave Sutton says he met Turgeon, III, recently and tried to interest him in the reunion. How about it, Turgie? Guy Riddell has returned from a year in Korea as consultant to the government. He is now resting at his Maryland farm. Charlie Hunter writes: "I do not think I will get to the 45th reunion much as I would like to do so. It may interest some of my old classmates to know that I was elected county commissioner of Elkhart County, Ind., last fall on the Republican ticket after a tough primary fight last spring. Also, the Adjutant General of the Army advises me that I am now on the retired list (reserve) as lieutenant colonel after some twenty-five years of service." A news item announces the retirement of S. E. Armstrong from the maintenance of way department of the New York Central Railroad after 45 years of service in various capacities. Ben Mooers retired in 1946 after 42 years as power operations engineer with the Seattle City Light Company. L. T. Howard is spending the winter at DeLand, Fla.

And now we come to two items which are not so pleasant. The last edition of the notes mentioned the death of Jack Draper. Five of our Class attended the memorial services at the Unitarian Church in Canton. The church was filled showing the high regard of the community. Another loss to the Class is Arthur Roberts who was a regular attendant at alumni and class affairs. He died on February 1 at Manchester, N.H., where he had lived since 1908. He was connected with the old Amoskeag Manufacturing Company and later with Amoskeag Industries. His widow and children have the sympathy of his many friends. Both Jack Draper and Art Roberts could have been counted on to attend our June reunion and we will surely miss them. The February Review

noted the deaths of Albert Read and George Shaw both last November but we have no other details. — EUGENE H. RUSSELL, JR., 82 Devonshire Street, Boston 9, Mass. CARLE R. HAYWARD, Room 8-109, M.I.T., Cambridge 39, Mass.

• 1905 •

An error in the February notes brings a statement from Tom Shaw that he was not an assistant vice-president of the American Telephone and Telegraph Company. Sorry to have to retract it but Tom says he was continually employed in the engineering department of the American Telephone and Telegraph Company from 1905 to 1919 when he became a charter member of the Department of Development and Research. The remaining third of his professional career was in the Bell Telephone Laboratory, starting in 1933 with the amalgamation of the Development and Research Department with that organization. He modestly says his only title was "loading engineer," in consequence of his specialization of various phases of the development and use of coil loading on telephone circuits. Just the same, Tom, that's "tops" to us. The *Herald-Sun* of January 9 carried a story of Grafton B. Perkins, now advertising consultant for Arthur D. Little, Inc., in regard to an extensive advertising campaign for the promotion of Puerto Rican rum in this country. Perhaps Grafton can be persuaded to advertise at our 45th reunion.

Much of the news this month concerns the wanderings of our classmates into the sunny south: Al Prescott at Hollywood, Fla., Gil Joslin at Winter Park, the Casey Turners at Vero Beach, the Prince Crowells and the Ed Barriers somewhere in Florida. Clarence Gage, permanently located, writes about calling on Harry Wentworth at the Vinoy Park Hotel at St. Petersburg. Clarence also saw L. J. Lyman, who was with us in our freshman year, the same afternoon. Clarence and Harry both inform me that Florida is such a large state that the chances of all our Florida travelers meeting are very remote. Bunny Loomis writes that he and Mrs. Loomis are wintering in Bermuda. The Ralph Hadleys are touring in Mexico. Gib Tower is still with the Navy Office attached to the Bethlehem Steel Company, shipbuilding division in Quincy, assigned to the stability and damage control of ships of the United States Navy. He believes he is now the only 1905 naval architect.

On Saturday afternoon, February 12, prior to the Midwinter Meeting at Walker Memorial, 12 of us met in Pete Harvey's room at the Hotel Statler and considered, informally, the matter of an organization for the gift feature of our 50-year reunion. General ideas were discussed and the matter was left for the Boston group to work out a plan to be formally presented to the Class later. Present besides Harvey were: Strickland, Damon, Shapira, Tower, Ball, Buff, Barrier, Marcy, Killion, Donald and your Secretary. Later, at the Midwinter Meeting, McLean and Balkam were present also. Chester Shaw, for many years in the accounting division of the United Shoe Machinery Corporation in Boston, has retired according to the com-

pany's retirement plan and is enjoying much leisure.

Robert Porter Nichols, XIII, died at his home, Searsport, Maine, on December 27. After graduation from Worcester Academy and spending two years at the Institute, Nichols was employed by the Eastern Steamship Company, the Maine Coast Steamship Company, Phillips Manufacturing Company of Worcester, Campbell Manufacturing Company of Barre, Mass., Wickwire Spencer Steel Corporation of Palmer, Mass., and the Moore Fabric Company of Pawtucket, R.I. Retiring in 1931, he busied himself with local civic interests; at the time of his death being vice-president of the Penobscot Marine Museum. — FRED W. GOLDTHWAIT, *Secretary*, 274 Franklin Street, Boston 10, Mass. SIDNEY T. STRICKLAND, *Assistant Secretary*, 69 Newbury Street, Boston 16, Mass.

• 1906 •

Four members of the Class attended the Midwinter Meeting of the Alumni Association on February 5. They were David Bloom, Chester Hoefer and the two Secretaries. Bloom was accompanied by his son, Albert, of the Class of 1950. David makes his home in Brookline and as he has not attended many class affairs the Secretaries were glad to welcome him back into the fold.

Announcement has been received of the marriage of Corinne Tetrault to Philip Hyde Darling, son of Henry E. Darling, which took place at Nantucket on January 4, 1949. Henry is vice-president of the New England Telephone and Telegraph Company, Boston, and resides in Cambridge.

The Secretary acknowledges the receipt of a post card from Frank Benham mailed at Miami, Fla., on February 16. Frank reports that it is very warm there all the time but from reading the *Boston Herald*, thinks he might have been nearly as well off at home.

The Secretary regrets that there is not more to report at this time. Usually the request for notes from the Alumni Office includes clippings of the doings of '06 men. No clippings were received; hence the lack of more news items. We will try to do better in the next issue. — JAMES W. KIDDER, *Secretary*, 215 Crosby Street, Arlington 74, Mass. EDWARD B. ROWE, *Assistant Secretary*, 11 Cushing Road, Wellesley Hills 82, Mass.

• 1907 •

Without doubt, by the time you are reading these notes, you have received from me a postal card announcing that we are going to hold a two-day reunion at Oyster Harbors Club at Osterville, Mass., from the afternoon of Friday, June 24, to the afternoon of Sunday, June 26, 1949. Members of our Class responded generously in returning to me the reply postal cards which were attached to the notices that I mailed early last February, and a sufficient number indicated that they would probably attend a reunion if one should be held on the dates mentioned, so that I feel quite sure that we shall have at least between 40 and 50 men present. Early in May, I shall expect to mail to all

of our classmates printed announcements giving information concerning all details with reference to the reunion and with a coupon to be detached and returned to me with definite indication as to whether or not the men will be present. I hope that some of you who read this and who may have notified me negatively last February will find that you can now attend this reunion and will act accordingly when you receive the final announcement.

When Leverett Cutten of Allentown, Pa., sent me a favorable reunion reply, he also wrote me a most welcome note, in which he said that during February he was to retire from his position as plant engineer with the Mack Truck Company where he has worked for many years. He also wrote as follows: "In March of 1948, I was carted to the hospital with pneumonia, and the next day my son William took my sister, who had the 'flu,' to one nursing home and my mother with a cold to another. They were each 20 miles from here and eight miles apart, so William was busy each evening making the rounds. Three days later Mother had pneumonia, too. My sister and I were home in two weeks. Mother put up a good fight for four-and-a-half months, but a second attack of pneumonia brought the end just five weeks before her 96th birthday." Most of you men will remember that Leverett has a hobby of silversmithing and that during the last 10 or 15 years has made very many beautiful solid silver articles of various kinds. Among these was a silver bowl which you men of the Class presented to me at our reunion in 1942. With his note written in February he sent me a sketch of a silver-gilt mace which he is making to be presented to Bates College at Lewiston, Maine, by the class of 1904 at Bates, of which Leverett is a member, in connection with the 45th reunion of their class. This mace is to be about 40 inches long, with the main shaft one and three-eighths inches in diameter, with many beautiful embellishments.

From time to time I have included in The Review notes many items regarding our famous and highly honored classmate, Clarence Howe, Minister of Trade and Commerce for the Dominion of Canada. The February issue of the magazine *Coronet* contains a story about Clarence which is rather fully quoted in an article published in the *Waltham, Mass., News-Tribune* of January 22. This city was the birthplace of Clarence and the city from which he entered the Institute. A few items of interest contained in this article I want to pass on to you. It is stated that as a wartime member of the Combined Policy Committee, Clarence was acclaimed by the late President Roosevelt as a "great quarterback." Mr. Roosevelt is quoted as saying: "If one play doesn't work, he always has another up his sleeve." Further items quoted from this newspaper article follow: "Mackenzie King took unprecedented action when he selected Clarence as a member of the Canadian Cabinet on the same day that he took his seat in the Ottawa Parliament in 1935. . . . He had won fame as a builder of grain elevators that had earned him an appointment to survey the wheat storage and transportation problems of Argentina. His recommendations were carried out to

the letter by the government of this country. . . . By 1935 he had given himself over entirely to government service and in that capacity has administered the greatest industrial expansion in the history of Canada. Among his jobs during the war was the running of the Eldorado Mining and Refining Company, source of the uranium used for the A-bomb. For this and other work he was awarded the Special Award of Merit by President Truman last summer. He also is the founder and guiding light of Trans-Canada Airways."

Leverett Cutten sent me a clipping from an Allentown, Pa., newspaper dated September 1, 1948, which told of the retirement on that date of Edward C. Story of our Class, who was supervisor of statistics in the financial department of the Pennsylvania Power and Light Company in Allentown. After 1907 Ed entered the employment of D. C. and W. B. Jackson, which later became Jackson and Moreland, of which Ed Moreland is now senior partner. In 1916 Ed Story left this firm to become senior appraisal engineer for the Board of Public Utilities Commissions for the State of New Jersey. Two years later he became associated with Thomas Conway, an industrial consultant, as a valuation engineer. Dr. Conway had been engaged in a study of the properties which were merged to form Pennsylvania Power and Light Company, and in June, 1920, Ed Story joined the newly organized utility. During his 28 years with this company he has held various responsible positions in connection with valuation and property records.

An item in the New York Times of January 18 tells of the death on January 17 in Scranton, Pa., of George R. Taylor, who was associated with our Class in the Course in Biology. He had been with the Scranton Spring Brook Water Service Company as chemist and bacteriologist since 1907. He was a member of the American Chemical Society, the American Public Health Association, and a past president of the American Water Works Operators' Association. He also was a leader in Boys' Club work for nearly 40 years, and at the annual banquet of Boys' Clubs of America held in New York in May, 1946, he was honored for outstanding service in boys' work. He is survived by his widow and two daughters.

When Jim Barker of Chicago sent me his postal card last February saying that he hoped to be with us at our reunion in June, he told me that he was going to South America with a group of engineers on February 15 to be gone for about six weeks. — The Alumni Office tells me that Commander John H. Walsh, who was associated with our Class in the Course in Naval Construction during our senior year, has moved from New Orleans, La., and is now located at Pass Christian, Miss. — BRYANT NICHOLS, *Secretary*, 23 Leland Road, Whitinsville, Mass. HAROLD S. WONSON, *Assistant Secretary*, Commonwealth Shoe and Leather Company, Whitman, Mass.

• 1909 •

We, who are working on the reunion are highly encouraged by the post card response to the first notice. Classmates, with their families, are planning to come

from far and wide. Many have written us personal messages including suggestions on what they would like to do when they get there. So far, there has not been a single request for a wheel chair. Chet Pope, X, has stated that he will welcome classmates to his summer home, "Red House," at South Yarmouth, near Hyannis, which is not far from Osterville. The notices which you will continue to receive will give you current information on the progress of our plans. Checks for financing the reunion continue to come but more will be needed, so that we have not as yet closed the books. Checks should be made out to Paul M. Wiswall.

Molly, XI, with Paul, V, and Johnny Willard, II, are energetically pushing the class fund as the several letters testify. We understand that the response has been most encouraging. While in New York recently, the Review Secretary ran into Johnny Willard at breakfast and we had a most interesting chat about class affairs. Later, when we called Molly he stated that Alumni of classes '01 to '10 were having a luncheon at the Shelton Hotel to discuss the Institute Endowment Fund, and would I come? Paul reports the meeting as follows: "Ralph Jope '28 was the master of ceremonies at the Shelton Hotel on Tuesday, January 25, with 24 Alumni present; and of the 24, a picked group, there were eight 1909 classmates. They were as follows: Harold Ballard, I, Chet Dawes, VI, Dale Ellis, XIV, Fred King, II, Chet Pope, X, Molly Scharff, XI, Harry Whitaker, VI, and Paul Wiswall, V. And if that isn't something! Out of the ten classes, one-third were from our own 1909."

The usual Midwinter Meeting of the Alumni was held at Walker Memorial on Saturday evening, February 5. There was not the usual large number of '09 men present, many of the old reliables being absent. There were present: Chet Dawes, VI, Austin Henderson, I, Francis Loud, VI, Joe Parker, I, and Chick Shaw, V. Alumni were asked to invite their sons and Austin brought Donald, who is doing electrical engineering work with the New England Power Company. Chick brought his two stepsons, Walter Rapp of the Pratt Institute, now an engineer with the National Biscuit Company, and Keith Rapp of the University of California, now in his first year at the Tufts Medical School. Francis, of Jackson and Moreland, who is doing some engineering work for the Connecticut Light and Power, came way from Hartford, just to attend the meeting. On comparing notes we learned that he was working in an office not far from that of Bob Keeney, III, who is with the Connecticut Light and Power, and the next week the two met.

Bob sent us some clippings about his son, Barnaby, previously professor of history at Brown University but recently appointed associate dean of the graduate school for the balance of the year and to become dean on July 1. He will be one of the youngest graduate deans in the country. He graduated from the University of North Carolina, obtained his master's degree from Harvard in 1937 and his doctor's degree there two years later. He is a veteran of World War II, served with the 35th Infantry of the United States Army

and took part in the battles of the Rhineland, Ardennes, and Central Europe. Among his decorations are the Purple Heart, Bronze Star, and Silver Star. He is the author of several scholarly articles. The Class congratulates both Bob and his son.

As usual, when we attend the American Institute of Electrical Engineers' Convention in New York, we run into classmates. This year it was Phil Chase, VI, and Tom Spooner, VI. Then, while at the Statler, Paul came to lunch with us and we ran into Bob Doane, VI, who made it a threesome. (See Paul's description below.) Then, en route back to Boston the same day, Tom Desmond, I, was in the same car with us on his way to attend the meeting of the visiting committee of the graduate school of engineering at Harvard. Clippings and other notices of Tom's activities in Albany are continually coming to us, but there is not enough space in The Review to record them all. He is still fighting to ban billboards from parkways and scenic highways and has introduced a bill to that effect as well as one to tighten controls over sleeping pills.

We are always glad to hear from King Bullens, III, who keeps in close touch with the Class and most enthusiastically is coming to the reunion: "Up to 1938 I had been quite active for many years in the Officers Reserve Corps in an effort to pass along my engineering and manufacturing knowledge to the younger officers, was convinced that war was inevitable, that one of the jobs to be done promptly was the complete revision of *Steel and its Heat Treatment*, and that I personally could not take an active part in its revision. Battelle Memorial Institute very kindly agreed to carry it out. The fourth edition appeared in two volumes in 1939 and the fifth edition currently in three volumes. Our company received its first major Navy ordnance contract for 1.1 projectiles in 1940, was the first small company to be awarded the Navy E and Bureau of Ordnance flag (December, 1941), followed consecutively by five 'Army-Navy E' stars, and during the war years made many 40 mm. projectiles, rocket parts, universal joints, and so on. It is now one of the important producers of universal joints nationally advertised under the trade-mark 'Neapco.'

"The writer's personal work may be summed up by a statement in *Ordnance* of September-October, 1947, under the caption, 'For Eminent Service We Salute These Industry-Ordnance Leaders.' 'Col. D. K. Bullens, an Ordnance Reserve officer, has served the Ordnance cause faithfully and well for many years. He is president of the New England Auto Products Corporation, Pottstown, Pa., and is an active member of the Advisory Board of the Philadelphia Ordnance District.' Last year awards were presented by the American Society of Metals at the 30th Metal Congress to a number of individuals who 'had made notable contributions to alloy steel development'; my name was amongst these 'for his inspirational work in collecting and publishing American practices in "Steel and Its Heat Treatment."' This year the name of the company was changed to 'Neapco Products Inc.'

Paul, in his own vivid way, describes our meeting in New York as follows: "Today, as it happens, is February 5, 1949. For no earthly reason I can think of I was looking over our senior portfolio. Somehow, Larry Forrest had been in my thoughts because I had been telephoning him about the campaign just being launched to raise a large sum to put the Institute plant in good shape. As I looked at the right page in the portfolio, there, indeed, was Larry — Laurence Raymond Forrest — and the birth date, February 5, 1888, and right next to Larry was the word about Carl William Gram and his birth date, February 5, 1888. So I phoned Larry, for he lives right here in Essex County, N.J. I warbled 'Happy Birthday to you, Larry' over the telephone, and Larry grinned all over. Then yesterday I went over to New York to meet our Review Secretary, Chet Dawes. Chet was here for an American Institute of Electrical Engineering Convention with Muriel and we were to lunch together at the Hotel Statler. In the restaurant, Chet seemed to know everybody, and there was Bob Doane who had just moved to Bucks County, Pa., from his old stamping ground with Anaconda up the Hudson at Has-tings-on-Hudson. He has recently purchased Willowick Farm where Mrs. Doane now lives and Bob goes there week ends. He expects to retire shortly and become a real farmer. Chet was to take a train at 2:00 P.M. to Boston and I bade them good-bye in time to catch that train. — Today on the phone there was Carl Gram, Jr., who lives in New York. He wanted to tell me that our Carl, X, 1909 President, was now a grandfather. That was a sweet bit of news. Carl himself is in England on a business mission. On this same February 5, Molly Scharff telephoned that he and Jeanne were driving out from Manhattan to call on Marion Jones and would I go along? So they stopped at Glen Ridge and picked me up and we three motored to Summit where we saw Marion and Reg, Jr., who is with a New York bank. It was a deep satisfaction to have Molly and Jeanne along as we three called on Marion so soon after Reg's funeral. This has been a good 1909 class week end."

This most interesting letter comes from Rev. Arthur E. Hartwell, II, through Molly. Arthur is vicar of St. Mary's Episcopal Church at Hillsboro, Texas, and of St. Alban's Episcopal Church at Hubbard, Texas. "Since our classmate, Fred Heidelberg, II, passed away, now many years ago, I seldom see anyone of the Class. Many of the members of younger classes are now in Texas and I do have contact with these from time to time. Should you or others of the Class come this way I would wish to be informed with the hope that we might make contact. Mrs. Hartwell and I have been here since the fall of 1947 but still retain our home in Houston, where our four grandchildren and five children live. We have two married daughters and one married son. A second son will be married January 29 leaving another son unmarried. The reunion this year sounds most interesting but at present there seems to be no prospect of my attendance." It is interesting to note that Arthur Hartwell and Fred Heidelberg are both side by side on page 11 of the class

album and both hailed from Houston as far back as 1909.

We are most pleased to announce that nearly everyone mentioned in the above notes has signified his intention of coming to the reunion with his family. Be sure to join us and make it a bigger family! — PAUL M. WISWALL, *Secretary*, 90 Hillside Avenue, Glen Ridge, N.J. CHESTER L. DAWES, *Review Secretary*, Pierce Hall, Harvard University, Cambridge 38, Mass. *Assistant Secretaries*: MAURICE R. SCHARFF, 285 Madison Avenue, New York, N.Y. GEORGE E. WALLIS, 1606 Hinman Avenue, Evanston, Ill.

• 1910 •

News from classmates has been very poor this last month and the only one I have met is Allen Curtis who was on his way to catch a train. — Achilles Hadjisavvas of Volos, Greece, writes as follows: "I am afraid I am just as busy this time as last — repairing track, bridges, and station buildings constantly blown up and burned to ashes by the guerillas — still it is such a pleasure to me to be allowed to continue keeping in touch with you. Believe me that my spirit is constantly hovering over Boylston and Clarendon Streets (I have not known Cambridge) where my education was completed but, still more, where I acquired the sense and love of freedom through my association with free American citizens — my fellow students of M.I.T. I have not lost this sense of freedom ever since, but, as you well know, the guerilla war, raging for so many years throughout the country and being at its climax just now, uses all means to detach it from us. I know that the brave citizens of your country offered all they could for our reserve and are still offering out of what is vital for their own sustenance, but we shall keep asking for more and more help till we die or live.

"With 700,000 refugees from agricultural areas, who left their homes running for their lives, and are now concentrated in the big cities, the scarcity of food supplies and other necessities of life is tremendous. What is worse still, we, the non-producing classes of the cities, have to feed them, when, under normal conditions, they were expected to feed us. Such being the case of the multitude, will it mean anything to you if, in view of the vast problems of poverty and devastation faced by hundreds of thousands of my countrymen, I confessed, as I perhaps ought not to, that I am still earning less than I did when I was 22 — looking then, in addition, to my Father for help — now that I have a wife to sustain and a daughter to educate (she is going to Athens by June this year for higher education at the American College) and yet I am happy and I can assure you that I am better off and only have to thank you for your kind and keen interest in what concerns me." — HERBERT S. CLEVERDON, *Secretary*, 120 Tremont Street, Boston 8, Mass.

• 1911 •

Congratulations to our Class President and to our Assistant Secretary on well-deserved promotions with the companies each has served so long and so faithfully.

In a story on January 26 announcing the election of Albert F. Metz to succeed Frank C. Jones, deceased, as president of the Okonite Company, Passaic, N.J., the Passaic *Herald-News* continued: "Directors also elected Donald R. Stevens, of Ridgewood, executive vice-president and a member of the executive committee. He was previously vice-president and works manager, a position he had held since 1928. A graduate of M.I.T., he came to Okonite in 1921, before then having been manager of the labor and aeronautical departments of Goodyear Tire & Rubber Co. He is a director of Okonite, of Paterson National Bank and of the Community Building & Loan Association. He is past president of the New Jersey Taxpayers Ass'n and is at present president of the Ridgewood Republican Club. He and his wife and son, Carver, reside at 141 Woodland Avenue, Ridgewood, N.J."

Earlier in January, John A. Herlihy, II, was made assistant general manager of the Boston Edison Company as well as one of the vice-presidents, which latter position he had held for a number of years, as head of supplies and labor relations. To both you loyal classmates our sincere good wishes for continued and increasing success and happiness.

We all are also very proud to learn that two of our illustrious '11 men are candidates for term membership on the M.I.T. Corporation this spring: Bob Haslam, X, for term member to July, 1954, and Luis deFlorez, II, to fill the unexpired term of Albert J. Browning '22 to July, 1951. We salute you both!

There were just 12 classmates at the 1949 annual Midwinter Meeting at Walker Memorial on February 5, but Carl Richmond, I, had his son, Dick, with him to make it a baker's dozen. In addition to Ye Sec and Carl and his son, there were: Obie Clark, II; Marsh Comstock, VI; Henry Dolliver, I; Fred Harrington, I; Roger Loud, VI; Charlie McManus, I; Morris Omansky, V; Bog Stevens, IV; Ted Van Tassell, X; and Aleck Yereance, I. For the third straight year Malcolm McNeil '26, associated with Carl Richmond, sat with us.

I find that there is an apology due Henry Dolliver, for in the January notes reporting the "talkaround" at the "seven come eleven" dinner I said he and his wife had three granddaughters — when it should have been two of the fair sex and one grandson. However, Henry reported another granddaughter born on January 31, so now the count is three and one in favor of the little darlings!

As Boston regional members of the Committee on Financing Development in New England (the \$20,000,000 program for M.I.T.), Region I Chairman, Ray Stevens '17, has wisely chosen Bill Coburn, I, and Lou Golden, VI. Speaking of Bill Coburn, perhaps you heard commentator Cedric Foster broadcast from Boston on the Mutual Broadcasting System on January 28; an analysis of business, featuring a talk with Bill — "a lifetime friend of mine who makes no claim to being what you might call an expert in economics." He went on to describe Bill as "a man who has survived 40 years of rough-and-tumble stock market and business conditions, including all the changes and alterations

and tinkering in our investment system which have been going on in Washington for the past 16 years, for with the exception of his service as an infantry captain in World War I, William H. Coburn, since his graduation from M.I.T. in 1912 as a member of the Class of 1911, has been in the investment counsel business."

In retrospect, Bill told commentator Foster that the San Francisco fire in 1906 caused insurance companies to liquidate many securities and the selling didn't end 'til 1908. Then in 1914 World War I began and the stock exchange had to be closed for four months. The year 1920 marked the end of the war boom and prices of commodities collapsed. In 1926 the postwar boom showed signs of slowing up, but the major depression didn't show up until 1932. Followed a short but rather severe depression in 1937 to March, 1938, and then Pearl Harbor and our entry into World War II broke the market badly in early 1942. In the fall of 1946 security prices broke sharply, thus bringing the following comment from Bill in support of his statement that there was a pretty definite recurrence of certain cycles in business and security markets: "From 1908 to 1938 depressions recurred every six years. From 1938 to the present time, the period between was but four years. On major depressions there has been a very definite 18-year cycle; 1896, 1914, 1932. Therefore, according to the cyclical theory, the four-year minor depression and the 18-year major decline are both due in the year 1950. If the present trend," said Bill in conclusion, "toward unlimited government expenditures results in higher and higher taxes at a time when we should be lowering them, as we did after World War I, it may not only bring about a major depression, but it will also radically effect our present economic system. Until the situation clarifies, we will follow a conservative investment policy for our clients and for ourself."

In the January 30 edition of the Boston Sunday Herald appeared a cut of "Boston Yacht Club's 1949 Slate of Officers" and right in the center was the beaming countenance of Vice Commodore Ralph E. Runels, I, head of the R. E. Runels Construction Company of Lowell. — Ralph Damon, I, who resigned in mid-January as president of American Airlines, was named on January 25 as president of Trans-World Airlines, with headquarters in Boston. — Monk deFlorez has moved his office from the upper '40s in Manhattan to just below Herald Square at 116 East 30th Street, New York 16, N.Y. Three other addresses at hand: Edward Kenway, I, United Shoe Machinery Corporation, 140 Federal Street, Boston 10; Frank F. Rupert, V, Mellon Institute of Industrial Research, Pittsburgh, Pa.; Leland D. Wood, VI, 183 West Thames Street, Norwich, Conn. — It is our sad duty to report the passing of Thomas F. McLaughlin, I, in March. We hope to obtain further details for publication in the May issue.

When these notes reach you, the tenth in our successful series of Alumni Funds will be just getting underway and to each of you, more than 150 classmates who actively supported the 1948-1949 Fund, my heartfelt thanks and a practical suggestion: Start your spring-cleaning at once

and clean up that little detail of making your annual subscription to the M.I.T. Alumni Fund. A Happy Eastertide to you all! — ORVILLE B. DENISON, Secretary, Chamber of Commerce, Gardner, Mass. JOHN A. HERLIHY, Assistant Secretary, 588 Riverside Avenue, Medford 55, Mass.

• 1912 •

Long before these Review notes reach you, you will have received by direct mail the complete story of the time, the place and the program for the reunion this June. Attendance at least equal to the 1947 event seems assured, and if half of those who were uncertain at the time of the canvass decide to come, it will be much larger. Let's go!

The Akron, Ohio, *Beacon Journal* recently published a biography in brief of William S. Wolfe, X, from which the following has been taken: "William Smock Wolfe, manager in charge of manufacturing operations in the American factories of Goodyear Tire & Rubber Co., is a kind-hearted man under a tough, executive exterior. In fact, his friends say you'd never dream that the man in his office is the same man that you find in his home. He's a genial host who enjoys playing tricky, almost impossible, quick-thinking games for relaxation. His friends put it this way: 'Bill is tough — but fair. He puts terrific pressure on his men, but they stand up for him.' He's a brilliant executive and organizer — not long ago *Life* magazine published his photograph and listed him as one of the factory production geniuses of the country. He doesn't pass the buck — but then as his friends say, he doesn't have to, for he never makes mistakes. Whatever Bill does, he does well — including golf. He doesn't have much time for it now, but when he did play 'he beat the pants off all of us regularly,' as a close friend admitted ruefully. The thumbnail sketch above comes from friends. An interviewer is lucky if he gets much more than his name and address from Bill himself. He's modest and not the least bit high hat. Wolfe was born at Pawling, N.Y. in 1890, but 10 years later the family moved to Marietta. After finishing Marietta Academy in 1906, Bill went on to Marietta College and was graduated in 1910 with a B.A. degree. When he went to M.I.T., faculty members told him that it would take him three years to finish the course. 'Two years or nothing,' said Bill. He finished in two years, receiving his Chemical Engineering degree in 1912. That year he came to Goodyear to work in the experimental department. He was chief experimental engineer when he resigned in 1921 to become a vice-president and first factory manager of Seiberling Rubber Co. He remained at Seiberling 13 years. When he returned to Goodyear in 1934, he went into the sales department, working particularly on truck and tractor tires. Then he returned to the factory in 1937 as manager of development. He was promoted to his present position, that of factory manager, in 1939. In 1916 Wolfe married the former Jessie Blackmore of Painesville. They have a son Donn, 23, employed by Goodyear at Wingfoot Lake. Bill is a member of Portage Country Club, the Masonic fraternity, Society of Automotive Engineers and a

trustee of Westminster Presbyterian Church. Bill is six feet tall, a vital, powerful man. His hair is thick, with a little gray in it. Now quite heavy set, he weighed only 127 pounds when he first came to Akron. He goes fishing when he gets a chance and does a great deal of gardening. He is fond of substantial reading and makes many automobile trips for pleasure. He has visited every state in the Union and has traveled extensively abroad."

Clarence McDonough, I, writes: "I was disappointed in the fact that I was unable to attend the last reunion of our Class as I was in the hospital with a broken hip and it has taken some months to recover. Naturally, I would like very much to attend the reunion this year. It is difficult to give you much news concerning myself, as no one considers his own activities news." — From Toronto, Canada, Bernard Morash, VI, sends an account of Dr. Compton's visit: "You will be interested to know that we have just been honoured by a visit by Dr. Compton. This was his first visit with us. He was selected from outstanding scientists to give this year's Wallberg Foundation address at the University of Toronto on January 11. He was kind enough to be here the day before so our club officers arranged a luncheon and in the evening our Club had a dinner at the Granite Club. I might say it was the outstanding event of the Ontario Club. Dr. Compton was introduced by the Hon. Robert Winters'33, M.P., graduate in Electrical Engineering, and Dr. Compton mentioned that M.I.T. was doing very well in Cabinet positions in the government at Ottawa, as we likewise have the Hon. C. D. Howe '07 as the Senior Cabinet Officer. He thought we did much better up here in this respect than you do on your side of the border and he graciously suggested that that might be the reason things went along so well up here. Many of you will remember classmate Strathy R. MacKellar, VI, who is head of a brokerage and investment company in Toronto. He is one of the staunch and regular members of our Club. I think we are the only two 1912 men in Ontario. Well, I think you are doing a good job in getting notes together for The Review and if everybody chips in with a note now and then, we will all be kept in touch with what our various classmates are doing. I always get a kick out of reading about our friend Champagne, our eminent Mining Engineering graduate who took a postgraduate course in dancing and who has made such a success in this field in all directions. If you mention this in your notes, I want Joe to know that I will be watching the television broadcast to get a close-up view of him and his famous doings."

The Salem *Evening News* recently carried an account of a talk by Nicholas T. McNeil, I, before the Salem Lions Club on the worthwhile things in life, which read in part as follows: "Nicholas T. McNeil, teacher at Salem High and supervisor of the local evening schools, as guest speaker, delved into the realm of the finer things in life, including the age-old quest of happiness. In his opening remarks on this subject, the speaker asserted that

some of the most brilliant men in history turned adverse circumstances into opportunity for greatness. . . . Mr. McNeil, a M.I.T. graduate, who practised engineering for ten years, then changed to the teaching profession, which he has followed for 25 years and also studied law, receiving a degree, stated that one way to achieve happiness is to help others and to contribute to one's community. The speaker then went on to the art of reading good books. He professed reading a book a day for 1000 days and still sets aside between two and five hours a day for reading. He said that reading the literature of the past gives one a better understanding about the present and the possible future. Terming the country's leaders in the Revolutionary days as the greatest galaxy of Americans in history, he asserted that they were all after the pursuit of happiness. "We all are, but the trick is in how to obtain it," he declared.

Harold Mabbott, II, sends more news: "As has been recorded, I retired a year ago and settled in Swarthmore, Pa., principally because we had no connections in either Florida or California where retired people are supposed to go. It was the only place where we could find a home to live in at the time. It is a nice quiet town and we like it. We do have plenty of room and hope to see some of our old friends here. Swarthmore is only about a mile from Route 1, about 12 miles out of Philadelphia. We had a short visit from the Priests in the fall during the Welding Society convention, which Malcolm attended. I had to make a trip to Texas in September and stopped at Dallas on the return for a few hours and saw Johnny Noyes and his family. I came back by way of Kansas City and brought one of our two daughters with her two small sons to spend the winter with us while waiting for an apartment to be completed. Got a Christmas card from Jesse and May Hakes saying that they were to take a South American Cruise in the near future. We saw their new place in Maryland and spent an hour or so with them last summer. Ray Wilson lives here in town. I saw R. T. Stone at one of the M.I.T. Society functions last spring but missed him at the last one."

Another reference to Johnny Noyes comes from F. Lawrence Mowry, XI, who writes: "Doubt if we'll be East next June. I was on a business trip to Texas last week so had an opportunity to see Johnathan Noyes in Dallas and spend a pleasant evening with him and family." — Colonel Richard C. Stickney, III, was retired from the Army for physical disability at the end of last October. He is now living at 51 Elm Street, Stoneham 80, Mass. Besides his wife, his family consists of a son living at home, who is a senior in high school, and a daughter living and working in Boston. He remarks that his hobby is wiping dishes.

Harold H. Brackett, VI, wrote that he would endeavor to attend the reunion this June and then went on to give some modest details about himself. However, a recent letter from Jim Cook was much more colorful, so Jim's letter is quoted: "Harold H. Brackett performs prodigious quantities of work as engineer-executive for

the Bell Telephone Company of New Jersey to keep ahead of the tremendous demand for telephone service. He relaxed for three weeks in October of last year at the ancestral farm in Limerick, Maine, which he has owned for some years. There is timber on the property in considerable quantity. Harold is an advocate of scientific cutting of forest lands to maintain steady production, to avoid fire hazard and to avoid soil erosion. Local lumber men operate on a 'cut all and create desolation' basis. However, Harold succeeded this year in having his timber cut scientifically, leaving much of the smaller timber still standing. He realized a good price for this cutting, stands a good chance for future profits at reasonable intervals and has, by example, called attention to the benefits of scientific lumber operation. All of this sounds like the mailman going on a long hike for a vacation. Nevertheless, Harold managed some fishing and shooting in odd moments and says he feels much refreshed." Jim also sent an announcement of the association of John D. Shore, IV, with the E. D. Sherman and Company, travel bureau of Boston. Jack writes: "Expect to devote the rest of my life to the art of travel, a hobby of mine right along." — Make your reunion plans now. Let's Go! — FREDERICK J. SHEPARD, JR., *Secretary*, 31 Chestnut Street, Boston, Mass. LESTER M. WHITE, *Assistant Secretary*, 4520 Lewiston Road, Niagara Falls, N.Y.

• 1914 •

This month we must again record the death of another classmate. Francis P. Gilbert died on January 17 after an illness of nearly two years, the last six months of which he was confined to his bed nearly all of the time. Gilbert came to the Institute from Beverly, Mass., having prepared at Beverly High School. He was a member of the Civil Engineering and Biological societies, graduating from the Course in Sanitary Engineering. His entire business life had been spent in his profession. His practice was in the North Atlantic states. His last service was as chief of the hydrology and hydraulics section of the Corps of Engineers, operating from the Army Base at Boston. Gilbert married Ethel May Poland on June 4, 1917. She and their four sons and three daughters survive him.

Bill Simpson, who a very few years ago moved from Long Island, N.Y., to Lakeside, Calif., writes that while the temperature did not get as low as some Easterners would have us think, it actually did drop ten degrees below freezing and ruined all new growth on his citrus and avocado trees. In spite of the fact that Bill has turned gentleman farmer, he reports that he still attends the American Chemical Society meetings in San Diego and occasionally meets an M.I.T. man there. He also regrets that he feels that the trek across the country would be too much, so he cannot attend the reunion. — In a somewhat similar vein, Harold Mayer of Portland, Ore., tells us that it is a long way from Portland to New Haven, and is a little bit too much to make for one engaged in academic work. Like Bill Simpson, however, he extends his best wishes

to all classmates who can attend the reunion. Ralph Salisbury, who was with us at our last reunion in spite of being a colonel in the Army during the War, also says he must be content with extending his best wishes to reunioners. He must be in California at that time, where he will be with his son and family. Ralph is stationed at Columbus, Ohio, where he is senior project manager with the Veterans Administration.

Colonel Lucian Burnham writes from Pasadena that he must join the well-wishers, as the transcontinental trip is a bit too long for him, too. As opposed to those who find it difficult to make the transcontinental trip, a whole host of letters have been received from '14 men east of the Mississippi saying that they will be with us in June. Indications are that this is going to be a grand reunion with a very large attendance. — Right from the source of the Mississippi, Dave Sutherland writes that he will make the trip east from Minneapolis and has induced Lyman Baird from the same city to come along with him. Dave has been having a very busy time of late. He is president of the M.I.T. Association of Minnesota and has just had Professor Campbell '15 of the Institute out there as their Lincoln Day speaker. In addition, he is active in the Luffbery Post of the American Legion and has just recently given a talk showing motion pictures of the cruise that he took from Minneapolis down the Mississippi to the Gulf of Mexico, up the Atlantic Coast, the Hudson River, Lake Champlain, and back through the Great Lakes. This was the trip on which Art Peaslee accompanied him part of the way. Dave's daughter, Mary, was married early in February, and to recuperate from the strain of the event, Dave started off a few days later for Miami, from which place he is planning an air trip through the West Indies, returning later to Miami Beach. He will then return to Minneapolis by way of the Louisiana and Texas oil fields. Your Secretary is about to suggest that we appoint Dave as our roving ambassador.

On the second of February there was a meeting in New York City in connection with the M.I.T. Committee on Financing Development, which translated means the raising of twenty million dollars. Classmates attending were Barratt, Dickson, Fiske, Richey, Russell, Snow. — Bob Townend, who is in charge of inorganic research for the General Chemical division of the Allied Chemical and Dye Corporation, traveled last summer with his wife to the Pacific Coast, visiting some of the interesting places in that area as well as going down to Old Mexico. A trip through the Yosemite was included and many colored movies were taken which Bob would be glad to show any '14 men dropping in on him at his home in Arlington, N.J. Bob also writes that he, too, has become a grandfather, but he is as yet uncertain whether the new grandson will enter M.I.T. or the University of Pennsylvania, which is the college of his paternal grandfather. — Paul Owen of New York City, who has been very active in the real estate and real estate security field in that area, has been made vice-president of Cross and Brown, with which

organization he has been associated in recent years. They are well-known New York City real estate operators. — A card from Lyle Webber tells us that he is general works manager of Moffat's Ltd., at Weston, Canada. He would be very glad to see any classmates who might be passing through Toronto. He resides at the Park Plaza Hotel in that city.

Just another reminder of our 35th reunion taking place at the Sheldon House, Pine Orchard, Conn., June 17 through 19. Charlie Fiske has accepted the general chairmanship and has an active working group arranging for the reunion details. — H. B. RICHMOND, *Secretary*, 275 Massachusetts Avenue, Cambridge 39, Mass. CHARLES P. FISKE, *Assistant Secretary*, 1775 Broadway, New York 19, N.Y.

• 1915 •

One month to go on this year's Alumni Fund and if the few remaining delinquents send in their checks, we'll just about hit our quota. — Tower Piza writes from 170 Lexington Avenue, New York 17, that he is a busy architect and builder spending most of his time on Lawn Gyland (New Yorkese pronunciation). — Herb Anderson, President of H. Brinton Company, Philadelphia, manufacturers of textile machinery, has been elected president of the Northeast Chamber of Commerce, Philadelphia. — It will soon be time for our 35th reunion in 1950. At the spring class dinner in Boston we'll put that efficient old committee of Max Woythaler and Weare Howlett back to work on locating a good place. — Among the many things that Honorable Herbert D. Swift produces and raises on his Windy Acres Farm in New London, N.H., is real maple syrup. What a going over he gives me in answer to the large cash order I sent him for one-half gallon: "Any one who orders syrup at the end of January ought to have his head examined. New syrup comes in in March, only a few weeks away. Do not get the idea to ferment what I send you. What you then have may resemble castor oil." I appreciate Speed's advice but I'll stick to bourbon.

The Class sympathy goes out deeply to Ben Neal in the sad passing of his wife, Margaret, on February 2. Those of us who knew her better and perhaps saw her oftener; the Gabe Hiltons, Bill McEwens, Gene Places, Weare Howletts, and Fran and I, will miss Margaret, always a gay, bright and generous hostess. — ANZEL W. MACK, *Secretary*, 40 St. Paul Street, Brookline 46, Mass.

• 1916 •

Your Secretary at this writing has been profoundly shocked to learn of the sudden and unexpected death of one of his close personal friends and one of the Class's most enthusiastic supporters and tireless workers, Russell H. White. Rusty was seized with a sudden heart attack early on the morning of February 19 and passed from us within a very few minutes after his affliction. It is quite useless to reiterate the work that Rusty has done, both for the Class and in his own right

because all are so familiar with it. His "Combined Gospels" made him world famous, and his constant energy and interest in everything made it a pleasure to work with him. The Class has lost one of its most active members, and he will be sorely missed as a personal friend and as a loyal and devoted alumnus. The sympathy of the entire Class is extended to Mrs. White and to all those bereaved by this tragedy.

On January 21, George J. Mead, co-founder of Pratt and Whitney Aircraft Company, and one of 1916's most widely known and admired members, died at his home after a long illness. George had seen an enviable engineering career become his during his three decades of ceaseless work, which included a position as special assistant to the Secretary of the Treasury during the late War, and the establishment of the aeronautical section of the National Defense Commission, which became the War Production Board. He also designed and directed the development of the Wasp airplane engine, which revolutionized military and transport aviation. Your secretary has personally extended the sympathy of the Class to Mrs. Mead and the bereaved family.

Jeff Gfroerer is doing very well, indeed, as chief executive of the Sound Scriber Corporation in New Haven. He sends this welcome addition to our notes: "Saturday, February 5, my wife and I had the pleasure of attending the graduation exercises here at Yale University. Henry B., and Frances Shepard's son, Henry, Jr., (also Phi Beta Kappa) was graduated with honors. Hen is one of the few '16 men with whom I have kept in contact through the years and time has ripened and mellowed the friendship and respect of our respective families. Since the summer of 1945 we have seen Henry, Jr., now and then, here in New Haven. We have found many things in common with his generation and for some time it has been Uncle Jeff and Aunt Fannie. It certainly gave both my wife and me a big 'lift' Saturday to know that young men like Henry, Jr., are ready and able to carry on when we older men quit, and there is certainly hope for this troubled world of ours. Frances and Henry Shepard are justly proud of their older son. I wish you could know this fine family as we do. There is not much new regarding myself other than we at the Sound Scriber Corporation have revolutionized an industry in the past eight years, so today all modern dictating and transcribing machines are fully electronic and use a plastic recording medium. Our latest development is our SoundEraser which makes the reuse of our discs possible for at least 26 times; with recording costs now almost at the vanishing point. You've probably also heard about the regularizing of telephone recording by the Federal Communications Commission on August 2, 1948. We also had a great deal to do with this as our dictation machines do a grand job of two-way telephone recording, which can easily be confirmed by many of the United States Government departments, Army, Navy, and so on. You might be surprised at my Sunday morning occupation; reading the Funnies. Reason; a seven-and-a-half year old son, Wes-

ley, whom we adopted last August, and who is our pride and joy."

We are sorry to hear that Charlie Foote has been laid up for several months, but are glad in turn to know that he is to be back on the job by the time this is published. He expects "to return to my post as general manager and director of the H. M. Sawyer and Son Company, Cambridge. My son is out of the Navy and attending Nichols Junior College at Dudley, Mass. Daughter Madeline is out of the Waves and now secretary and receptionist at the M.I.T. Personnel Office. Daughter Julie-Anne is buyer at Jordan Marsh Company. My hobby is still golf, although it appears that it will be inactive for another year. During the War, I was New England regional head of price control in the O.P.A." — Joe Brodli makes his regular report from California, giving the weather very little credit for anybody's happiness out there. He should have wintered in New England! Joe has spent some of his time looking up classmates in the area, and had a short chat with Carl Carstens, whose promise of a letter has not materialized, as yet.

A number of notes arrived from around the country during the past month, some brief, some long, but all of them were most welcome and are hereby passed on to the rest of the Class. Ralph Davies, from Pittsburgh, expresses his regret at not writing sooner (if all of you would spend the time writing us that you spend apologizing for not writing, even two secretaries couldn't handle the rush) and goes on to say that he has just about completed 30 years continuous service with the Aluminum Company of America. Though he has a married son in Schenectady and a married daughter in Elmira, he states that he is not yet qualified as grandfather. Warren Strangman from nearby Charlestown, Mass., makes note that he served in both the Army and Navy in the last War, and has, for 30 years, been employed by the Eastern Inspection Bureau, a stock company fire insurance organization. For 26 of those 30 years he has been happily married. He further relates: "One pleasant item which will interest you is that I see Mrs. MacLaurin frequently on Sundays at church in King's Chapel, of which we both happen to be members. This brings back to me delightful memories of earlier days when she was in the habit of so kindly inviting to her home students of the Institute for pleasant informal evenings."

Walter Aiken opens a brief letter with the statement: "Yes, this is a letter from me," which rather indicates his own surprise at finally contacting us. He proceeds to state nothing has happened to him except to get older. He does say he hopes to see your Secretary in West Chelmsford and then give us some news for The Review. Still waiting, Walter. Harold Lerner, way out in Long Beach, Calif., informs us that a stubborn case of arthritis has kept him down during the past several months, part of that time in the Naval Hospital at Long Beach. However, his fight has been successful, we're glad to report, and he plans a trip East to Massachusetts sometime this summer, and hopes to see us and supply more news. He, too, sends his best regards to the rest of the

Class. — A very brief note arrived from Ray Low in San Diego: "I am not lucky enough to be retired and at the present I am with William R. Staats Company, investment brokers. When I have any time off I hunt and fish, either in our back country, or in Lower California." — Also a brief bit from one of the members of the fair sex who attended the Institute with us these long years back. Louise J. Peet, Head of the household equipment department of Iowa State College, feels she is not entitled to be a classmate, having spent only a term at Technology, but we have assured her to the contrary. For further details she refers us to *American Men of Science* and *American Women*, in which her biography appears, though she feels it has no interest. We, however, are sure that it does. She is also coauthor of a text book, *Household Equipment*, now coming out in its third edition.

On January 26 a group of '16 men got together for luncheon at the Hotel Shelton on the invitation of Marshall Dalton '15, Chairman of the M.I.T. Committee on Financing Development. At the luncheon were groups from three or four other classes, including 1913 and 1917, and we heard something about the big development program ahead for the Institute; and when we say big, we mean big! Those present included: Bill Farthing, Joe Barker, Bill Barrett, Walt Binger, Art Caldwell, Del Delabarre, Harold Dodge, Jim Evans and Dutch Gaus. — At another meeting in Providence in honor of the retiring director of public works of Rhode Island, we encountered Bill Sloan of Providence. We have needled Bill for news, but so far, no results. It's good to see you fellows, though, and know you are still around. — Walter Binger was at the dinner of the American Institute of Consulting Engineers at the New York Yacht Club on January 17. He introduced the speaker, Walter Lippman, and did a wonderful job of it. We also see from a clipping in the *Christian Science Monitor* that New York City has a new Traffic Commission with high hopes for ultimately relieving virtually chaotic conditions of congestion on that city's streets. The Commission was set up after "long months of public pressure directed by the Traffic Action Committee headed by Walter D. Binger." — Speaking of meetings, one William W. Drummey, of Drummey-Duffill, Inc., was speaker at the annual dinner of the surveying and mapping section, Boston Society of Civil Engineers, on January 19. His subject was "The Relationship between Architect and Engineer-Surveyor." How about more news, Bill?

Roswell M. Rennie, Cairo, Ill., finally came through, after prodding by both Secretaries, with some news of his own life since 1916 days. He was with the Naval Flying Corps during World War I, and ended up in charge of machine shops at the University of Illinois. "It did not take me too long to decide that I was not cut out to be a teacher. I spent the next 17 years with Pink and Company here in Cairo, at the end of which time I sold out my interest and since that time have been in the general insurance business. I had long been interested in insurance and had done considerable study-

ing along that line. I find it to be extremely interesting and a constantly changing business. I have one daughter who is now associated with me in business, after finishing at the University of Illinois in 1946. If at any time any of our old classmates are passing through Cairo, I would be only too glad to have them get in touch with me." — A clipping we have on file, dated late in December, but always interesting, shows Steve Brophy receiving a scroll for good citizenship from Frank M. Totton, grand master of Masons, New York State, at Grand Central Station on behalf of the American Heritage Foundation, of which, you know, Steve is president. The Foundation also received the good citizenship medal from the Sons of the American Revolution.

We have a bit of information about Ralph Bagby who has his own business, Bagby and Company, out in Evanston, Ill., filling and packaging equipment for food products plants. Baz doesn't talk very much but he had an extraordinarily brilliant World War II record which we'll outline below. His two older boys were in the service, too. The oldest, John, graduated from Cornell last June, and is with Chrysler Institute in Detroit. The only daughter, Betty, is a freshman at Radcliffe, so we understand the folks at home have some reports on M.I.T. They expect to pick Betty up in June and hope to see some of the old gang in or around Cambridge. In World War I, Baz was a captain in the Air Corps and with the Army of Occupation 18 months. He re-entered service in 1942 and was a colonel, being chief of staff XII Troop Carrier Command, Sicilian and Italian campaigns; became assistant chief of operations (in charge of airborne operations) Allied Expeditionary Air Force, January 1944; jumped with American paratroopers to participate in disorganizing beach defenses, Normandy, France, June 5, 1944. He was awarded the Distinguished Service Cross, Silver Star with oak leaf cluster, 5 other citations for valor, Air Medal, Legion of Merit, Bronze Star, Honorable Commander, Most Excellent Order of the British Empire, Croix de Guerre with palm (1918 and 1945), Legion of Honor (France), Order of the Crown (Belgium), and Mackay Trophy for 1919. We must add here our simple congratulations on behalf of the Class. We surely are all proud of you!

In closing, we must bring to the Class's attention plans for a monthly get-together luncheon in Boston for classmates in that area. Rusty White was instrumental in arranging it, and his presence will be missed. The time: monthly, on the second Tuesday of each month, between 12:00 noon and 2:00 p.m., with time flexible enough to allow coming and going easily. Place: Thompson's Spa, 239 Washington Street, opposite the Boston *Globe*, where M.I.T. Alumni meet daily. No advance notice is needed. Just come. We hope to make this a regular and successful monthly gathering. See you there. —RALPH A. FLETCHER, *Secretary*, Post Office Box 71, West Chelmsford, Mass. HAROLD F. DODGE, *Assistant Secretary*, Bell Telephone Laboratories, 463 West Street, New York 14, N.Y.

• 1917 •

Henry Strout arranged a cocktail meeting at the Engineers Club, preceding the Alumni Association Midwinter Meeting on February 5, for such members of the Class as had found their way to Cambridge for the day. Ted Bernard, Art Dickson, Rudolph Beaver, Ken Childs, Stuart Gurney, Al Lunn, Tom Ryan, Ray Blanchard, Lobby, Ray Stevens and Tubby were present, and went on to the dinner afterward. This was the first meeting Stuart Gurney had attended in many months. He is now raising blueberries south of Boston for a life's work, with engineering for Liberty Mutual as an avocation, and will be able to attend more meetings in the future. — Claud Roberts, Colonel of Ordnance in Washington, was in Cambridge at the end of January, and had lunch with Lobby, Ray Stevens and President Strout.

John DeBell writes that DeBell and Richardson, Inc., has moved to new quarters in Hazardville, Conn., where the exact address is Post Office Box J, Hazardville (John continues to live in Springfield). To quote from his letter: "Wednesday, December 1, was moving day. We have moved our offices and laboratories to the building which we have purchased and remodeled in Hazardville, Conn. This place is just 10 miles from the center of Springfield, Mass. It is located just off Connecticut Route 20, one mile east of the village of Hazardville. In our main building, we have 10,000 square feet, a two-story building, with our offices and chemical laboratory on the second floor, and with our machine shop and compounding room on the first floor. In addition, we have a smaller building which we use for the storage of hazardous chemicals, solvents, and so forth. We have also consolidated here our pilot plant equipment which was previously located in Easthampton, Mass. Our building is about 55 years old, with brick walls, 16 inches thick around the first floor, and 12 inches thick around the second floor. The building is sprinklered and we have 24-hour, two-day watchman service. We are now rapidly getting settled in this new location where we have much more freedom of action, more and better capacity to do work, and clean, pleasant surroundings. You must drop in sometime to see our citadel."

A note came from Peso Moody in Oklahoma, advising that he is moving to Texas on a new job. He will be with the Texoma Natural Gas Company in Fritch, Texas, at one of their large field compressor stations. —RAYMOND STEVENS, *Secretary*, 30 Memorial Drive, Cambridge 42, Mass. FREDERICK BERNARD, *Assistant Secretary*, 24 Federal Street, Boston, Mass.

• 1919 •

Thirty-year reunion selection of place and date is still under consideration by your committee at the time of this writing, but we hope you will have received word by the time this is published as to the selections made. There seems to be considerable enthusiasm from all of the Class for this get-together and without the handicaps of the war years it should be well represented and a very good oppor-

tunity for the Class to get together, swap experiences and reminisce about the good old Technology days and reunions. Among the notes received this month, Arthur E. Page, 27 Wilson Road, Stoneham 80, Mass., writes: "Yes, I will be at the 30-year reunion. I'm looking forward to it with pleasure. I'm production superintendent with Daggett Chocolate Company, confectionery business. I'm post commander of American Legion Post of Stoneham. Have a son at Wharton School, University of Pennsylvania." Also the notation, "OK on reunion," from Ed G. Moody, while Ralph H. Gilbert says: "I am looking forward to our 30th reunion" and adds, "Have been holding this up 'til I had some news. My son Robert, 17 years old, graduated from Brooklyn Technical High School February 1 and has just started in at Brooklyn College. Daughter Ann, 14 years old, is a sophomore at Erasmus Hall High School, Brooklyn."

Otto Muller says that he can't definitely say what he'll be doing when the reunion comes but we all hope he will be able to make it this time. — James R. Moore, 420 Industrial Trust Building, Providence, R.I., sent the following notes: "First World War United States Base Hospital outfit 44 from Massachusetts Memorial Hospital, Boston, Mass. Two years Wool and Worsted. Twenty-eight years Cotton Textiles. Two daughters, married. Grandfather, twice. Work, Providence, R.I. Summers, West Falmouth, Mass. Age, 52. Still a Republican." — Webb C. Patterson dropped a few lines from Waltham. — Bernard S. Coleman is still in Los Angeles and Charles C. Likins has moved from Kansas City, Mo., to 2021 Delmar, St. Louis, Mo. — Al Richards dropped into the office about a week ago and reported on the Midwinter Meeting of the M.I.T. Alumni Association on February 5 at Walker Memorial, at which event the following were present: Red Lee and son, Wirt Kimball '18, Arklay Richards and two sons, Hy Selya and son, Art Kenison, Jesse Stam, A. Contieri and son, Freddie Britton, George Michelson and son, Maurice Role and son, Fred Markus, George McCreery, Karl Nutter, Margaret Pierson, Gene Mirabelli and Al Richards. — EUGENE R. SMOLEY, *Secretary*, The Lummus Company, 420 Lexington Avenue, New York 17, N.Y. ALAN G. RICHARDS, *Assistant Secretary*, Dewey and Almy Chemical Company, 62 Whittemore Avenue, Cambridge 40, Mass.

• 1920 •

It is with a heavy heart that I must report the untimely death of David Wexler. Dave was a well-known architect hereabouts and he designed many buildings in and around Greater Boston. He lived in Brighton and leaves his wife, son and daughter. He had many friends in the Class and will be sorely missed.

The new Speaker of the House, State of Vermont, is J. Harold Stacey of Windsor. He has served for four terms in the Vermont House. He operates a retail lumber business in Windsor. — Bob Aborn is assistant director of the research laboratory, U.S. Steel Corporation at Kearny, N.J. He is prominent in the American

Welding Society and won the Lincoln Medal of the Society in 1941. He was with the War Metallurgy Committee of the Office of Scientific Research and Development during the War. Vice Admiral Ed Cochrane was the principal speaker at a meeting of the Worcester Economic Club recently, his subject being, "The Navy and the Future" and making a strong plea for preparedness. Rear Admiral Frederick W. Pennoyer, Jr., is now commander of the Naval Air Material Center in Philadelphia.

Art Atwater has left Cleveland and has gone to Houston, Texas, address 4007 Childress Street. Art Dopmeyer has left San Francisco and is back in Boston. He may be located at Room 220, 120 Boylston Street. — HAROLD BUGBEE, *Secretary*, 7 Dartmouth Street, Winchester, Mass.

• 1921 •

Harry P. Field, Vice-president and Commercial Manager of the Hawaiian Electric Company, Ltd., of Honolulu, and our most recent addition to the secretarial committee, breaks the tape with the first letter of the month. Harry writes: "Enclosed is an article on John J. Winn, Jr., who has just resigned as vice-president and general manager of the Honolulu Gas Company, Ltd., and who has gone to California. We certainly enjoyed having him here and are sorry to see him leave." The article relates how Jack made an outstanding record in rehabilitating a company which had suffered greatly from overload conditions and lack of proper maintenance and replacement during the war. It was under his administration, from March, 1946, to January, 1949, that the company expanded and improved its plant to become one of the best of its kind. Jack is also credited with having placed the company in a vastly improved financial condition. Jack was born in Haverhill, Mass., on July 15, 1897, attended Chauncy Hall, and was graduated with us in Course X. He joined the Stone and Webster organization as an industrial engineer with the Haverhill Gas Light Company and later went to the Fall River Gas Works Company as chief industrial engineer and sales manager. In 1929, Jack went to the Consolidated Gas, Electric Light and Power Company, Baltimore, Md., as supervisor of sales promotion and served that company until June, 1936. He conducted a special study for the Hartford Gas Company, Hartford, Conn., during 1936 and joined Ebasco Services in October, being assigned to the Portland Gas and Coke Company, Portland, Ore., as commercial manager. In October, 1942, he accepted a commission as lieutenant colonel, Corps of Engineers. He went to the European Theater of Operations as deputy chief engineer of the supply division and had charge of the logistics of engineering supplies. He was awarded the Bronze Star and Citation Ribbon. The arduousness of these duties was in inverse ratio to his weight, which dropped from 214 pounds when he went overseas to 135 pounds when he was discharged from a hospital in October, 1945. On his return to civilian status, Jack served as industrial analyst with the First National Bank of Portland, Ore., until he went to Honolulu. With Mrs. Winn, he

has taken a cottage at Carmel, Calif.

Joseph J. Schaefer and James S. Parsons are reported to be located in New York City. Joe has come east from his long residence in Wyandotte, Mich., to represent his old firm, the Wyandotte Chemicals Corporation, in their offices at 60 East 42d Street, New York 17, N.Y. Jim has returned from San Francisco and is living at the University Club, 1 West 54th Street. Leland H. Hewitt, a colonel, Corps of Engineers, is in charge of the United States Engineer Office in Seattle. Dr. Frederick S. Dellenbaugh, Jr., reports he may now be reached by addressing Post Office Box 511, Huntington, N.Y. A note from Samuel E. Lunden says he has been somewhat out of touch with class affairs. Sam has an architectural office in Los Angeles and Roger Hayward '22 is associated with him.

Walter A. Jayme has been made general superintendent of the Gary Works of the National Tube Company, according to a recent announcement by the parent company, United States Steel Corporation. Walter has been associated with United States Steel subsidiaries since 1935, when he joined the Carnegie-Illinois Steel Corporation as metallurgical contact representative. In succession, he became manager of the metallurgical department's alloy bureau, general superintendent of the Wood Works, McKeesport, Pa., and then an executive of the Duquesne Works. Four years ago he became director of research and development of the National Tube Company's war rocket project at the National Works in McKeesport and later served as assistant to the general superintendent of the Tube Company's plant in Elwood City, Pa., before going to Gary.

Ray St-Laurent sent several interesting clippings from Hartford and Manchester, Conn., newspapers containing extensive accounts of the glowing tributes paid to Saul M. Silverstein for bringing the school building program to its present high degree of development in the two months he has been chairman of the Manchester school building committee. Saul, who is president of Rogers Corporation in Manchester, achieved unanimous approval at an open hearing for his schedule to build two new schools now, draft plans for a third and add to present structures. The text of the articles is too long to reprint in detail, but it emphasizes that Saul and his committee did a particularly thorough job which will now be submitted to a public referendum. Larry Castonguay is mentioned as having taken part in the meeting.

Norborne L. Rawlings, wartime director of the San Francisco Naval Shipyard, who retired as a rear admiral after many years of naval service, has been appointed assistant general manager of the Newport News Shipbuilding and Dry Dock Company, according to an article in the *Norfolk Virginian-Pilot*. A native of Virginia and a graduate of the Naval Academy, he served with a destroyer flotilla in World War I and subsequently received his master's degree with us in naval architecture and marine engineering. His Navy assignments have been almost entirely in ship construction and he was twice awarded the Legion of Merit in World War II.

It is with heavy heart that we record the loss of three members of the Class and extend sincere sympathy to their families. — Robert Edmund Beard died on December 22, 1948, at the age of 57. He originally joined Standard Oil Company as a chemist in the Whiting, Ind., research laboratory. In 1922, he was transferred to the Casper, Wyo., Laboratory and then from laboratory to operating work the next year. After advancing through various operating positions to that of manager of the Rocky Mountain division, he became manager of the Sugar Creek, Mo., refinery in 1939, a position he held until his death.

Dwight Baldwin, a director and partner of Fred J. Early Company, died on January 7, 1949. The firm's chief engineer, he had been with the company for the past 15 years. A native Californian and graduate of the University of California, he received his master's degree from the Institute in Course II. He was the author of several important engineering articles. He was a member of the Engineers Club of San Francisco and Tau Beta Pi. A veteran of World War I, he had previously been associated with the American Bridge Company. He is survived by his wife and four children.

Curtiss Tarring Gardner died on February 10, 1949, at his home in Madison, Tenn., after a long illness. Born on September 10, 1898, Curt prepared for the Institute at Nichols School, Buffalo, and was graduated with us in Course II. For many years he had been located in Baltimore, Md., as the service manager of the Liberty Mutual Insurance Company, retiring about five years ago to divide his time between a home in Tice, Fla., and his camp at Dwight, Ont., as a free-lance writer. He was the author of numerous articles and magazine stories and the widely advertised mystery book *Bones Don't Tell*. About two years ago, Curt left Florida and embarked on a series of travels, including a trailer tour of the United States, in order to collect material for a new book. He leaves his wife, a married daughter, Nancy, and a son, Tarring. — We are indebted to George D. Whittle '08 for the notification of Dwight Baldwin's passing and to Robert W. Tirrell '20 for his letter about Curt Gardner.

Victor S. Phaneuf, wartime lieutenant colonel, has changed his Durham, N.H., address to 31 Oneida Road, Winchester, Mass. In answer to our inquiry, Vic promptly wrote a most welcome letter which says, in part: "Soon after our reunion last summer, I took a long vacation to make up for the war period and the steady grind since my return to civilian life. My wife and I decided to go to places we had wished to visit during those seven years. We bought a new convertible and drove to Lake Ontario for boating, fishing, sight-seeing and golf, followed by visits to several New England beaches on Cape Cod, in New Hampshire and Maine, climaxing the summer by a stay in the Laurentian Mountains in Quebec. In October, I started a new association as general business manager for Bond Brothers, Inc., general contractors of Everett, Mass. My new work is very much like that which I did as construction engineer and assistant treasurer for a contractor from 1924 until

1941, when I went into the service. My new associates specialize in industrial building and underground utilities. I have purchased a house in Winchester, where we had many friends and have found more in the large number of Institute Alumni."

While you're resting from those early spring activities, take care of Lark Randall's yearly reminder of the new Alumni Fund and also drop a note to your Secretary. — CAROLE A. CLARKE, Secretary, International Standard Electric Corporation, 67 Broad Street, New York 4, N.Y.

• 1922 •

A release from the Standard Oil Company of New Jersey, dated January 14, reads in part as follows: "Peter T. Lamont, Assistant Coordinator of Marketing for foreign affiliates of Standard Oil Company (New Jersey), has been appointed Coordinator of Marketing. Mr. Lamont has been with Standard Oil Company and affiliates since 1922 with the exception of the war years. A Commander in the United States Navy, he served as operations officer in charge of tanker movements for the Normandy invasion and planned the movement of gasoline and other oil products to the Allied beachheads. Graduated in 1922 from . . . Technology with a degree in Petroleum Engineering, Mr. Lamont went to work as a clerk in the Company's sales department, after a period of service as student engineer in the oil fields and the Company's refineries. In 1925, he went to Europe as a marketing assistant. Later, he served on the Boards of Management of affiliated companies on the Continent. When he left for war service, he was Marketing Advisor for Southern Europe. After the war, he returned to the Company as Shareholder's Representative for European affiliates. In 1946, he was appointed the Company's Marketing Advisor for Central Europe, and in 1948, was named Assistant Coordinator of Marketing for all foreign affiliates. Mr. Lamont was born of American parents in Rotterdam, Holland, in 1900. He lives in New York City with his wife and daughter."

The following appeared in the *Kennebec Journal*, Augusta, Maine, on December 9, about Bob Purinton: "Willard B. Purinton who has served three terms on the City Council, is Ward 3's Republican candidate for alderman in the city elections Monday. [Note: The elections were duly held and Bob was elected.] Mr. Purinton is active in several local organizations which include the Rotary Club, Elks, Augusta Lodge of Masons, and the Chamber of Commerce of which he is vice president. He is president and treasurer of Purinton Bros., fuel dealers. He lives at 78 Winthrop Street with his wife and two children, William, 12, a pupil at Smith School, and Anne, 15, who attends Chatham Hall in Chatham, Virginia." If we have other politicians in the Class, your Secretary would be glad to receive word of their current activities.

Milt Manshel's older boy is a junior at the University of Missouri, living at the Zeta Beta Tau House, 915 Richmond, Columbia, Mo. He is quite active on the campus, being, at present, managing edi-

tor of the *Missouri Shamrock*, an undergraduate engineering school publication, engineering representative to the S.G.A. (Student Government Association, at a guess) and vice-president of the Tiger Claws. Milt, Sr., speaking for himself, reports that he is still at the same stand, business in Newark, home in West Orange, and sees, from time to time, a few of our classmates at the meetings of the New Jersey alumni club.

Sam Reynolds sends news of the meeting of the Class in New York on January 26. The dinner was followed by reports from President Grover and Treasurer Vilett. Moving pictures of the 25th and some of the other previous 5-year reunions were shown. The feeling at this meeting was that another should be held in May. The following men were present: A. B. Alland, W. W. Bainbridge, D. M. Broudy, C. J. Burke, R. C. Burrus, Nathan Cherniack, L. W. Coddling, R. F. Cummings, C. G. Dandrow, F. M. Didisheim, H. J. Duge, A. J. Frappier, C. W. Greening, C. D. Grover, J. F. Halpin, D. H. Harris, L. F. Hickernell, Frank Kurtz, F. S. Lincoln, M. M. Manshel, H. F. Metcalf, W. H. Mueser, A. P. Munning, James Nesmith, 2d, Judd Payne, P. M. Phillips, S. H. Reynolds, R. C. Rundlett, H. McA. Schley, G. B. Speir, S. M. Strauss, R. D. Stuart, Jr., J. H. Teeter, E. R. Thomas, J. A. Tishman, L. W. Trowbridge, E. VanB. Van Pelt and E. W. Vilett.

By means of a quick telephone roundup (our apologies to those who weren't reached), the following members of the Class gathered for drinks and dinner in the Hotel Kenmore early Saturday evening, February 5, before the Midwinter Meeting at Walker: Dave Abrahams, Myer Alpert, Parke Appel, Fred Brittain, Yard Chittick, Saul Copellman, Jim Duane, Colver Dyer, C. H. Edwards, Warren Ferguson, Morris Gens (who very generously supplied the major part of the liquid refreshments), Harris McIntyre, H. L. Rosengard, Bill Russell, Sam Seegal, Tom Shepherd, Ros Sherbrooke, John Starkweather, Bob Tonon, John Vaupel and Frank Wing.

There was general agreement that the '22 men in the Boston area should get together on more frequent occasions. Up to the present, the Midwinter Meeting has been the only excuse for a gathering of this kind, apart from the regularly scheduled June annual and 5-year reunions. At the aforesaid Boston '22 dinner before the Midwinter Meeting, it seemed to be the consensus that an all-day outing on Alumni Day, Saturday, June 11, might strike a responsive note. Accordingly, in order to provide an opportunity for an expression of opinion by those who might care to participate, your Secretary, with the advice and consent of the Boston nucleus, has formulated the following tentative plan for June 11. It should be understood that no one is urged to join in this alternate Alumni Day plan. It is only for those who may think it a pleasant diversion. In other words, no pressure, no compulsion.

1. One of our classmates, with a summer place on the south shore between Boston and Plymouth, has offered his establishment for the day. 2. One or more M.T.A. buses (capacity 41 seats) will be engaged

to start from the Hotel Statler at some convenient time, say 9:00 A.M., to drive those who would like to travel as a group. 3. Those who would prefer to go in their own cars are, of course, welcome to do so. 4. There will be no planned entertainment. Sufficient food (perhaps in the form of "make-your-own-sandwiches") will be on hand to prevent starvation until at least dinnertime. And, it is also thought that a barrel of iced beer would be a help. 5. It probably would be possible to arrange for golf at Marshfield, Plymouth or Duxbury for those who might like to play eighteen holes. 6. The bus, which will lay over at our destination, will return to Boston to reach the Statler about 5:00 P.M. so that we can meet as usual in Whit Ferguson's room for more of the same. Here, clothes can be changed for the evening Statler banquet, if necessary. 7. The cost of a 41-passenger bus will not exceed \$70 for the day, so, if we can count on a group of at least 20 to 30, the transportation cost will be small. Other expenses can be pro rated, and likewise will be modest.

Will those reading the above, who think they would like to join in this plan, please write to the Secretary so that we can determine whether or not there is sufficient interest and so other necessary arranging can be started. Further information will be in the May Review. It should be distinctly understood that the foregoing is not intended to conflict with or upset the general reunion plans formulated by the Institute. It is merely based on the expressed desire of those who were at the Midwinter Meeting who thought that a variation from the usual routine would not be amiss. It is not suggested that those who would prefer the Institute activities during the day should in any way change their plans. No doubt there will be a division of opinion, with some preferring to stay in Cambridge and others preferring this outing.

New addresses: Platt C. Benedict, Newmont Mining Corporation, Suite 1501, 14 Wall Street, New York City; Leonard M. Passano, Jr., Echo O' The Morn Farm, Pine Tree Trail, Route 202, Upper Gloucester, Maine; Ward E. Shearer, 151 Prospect Avenue, Mt. Vernon, New York; Leslie C. Stevens, Rear Admiral, Naval Operations, Mail and Dispatch Section, Navy Department, Washington, D.C.; Gaylord A. Wood, 212 North Andrews Avenue, Ft. Lauderdale, Florida. — C. YARDLEY CHITTICK, *Secretary*, 77 Franklin Street, Boston 10, Mass. WHITWORTH FERGUSON, *Assistant Secretary*, 333 Elliott Street, Buffalo, N.Y.

• 1923 •

It was expected that the report on the 25th reunion would be of interest to many of those who were not able to attend and particularly to those located a long way from this country. This is confirmed in a letter from Frederick T. Entwistle in Argentina, where he has been located since 1947 as director of production for Ducilo Productura de Rayon. Entwistle says that he actually was in the States at the time of the reunion and expected to join us for at least a day in Connecticut but he was scheduled to sail the week end after the reunion. Due to a mix-up in his papers for

re-entry to Argentina, he had to be in New York instead of coming to Connecticut. This, he said, was a bit of a disappointment to him. He observes that after seeing from photographs how some of us have put on weight, he can admit to being 50 pounds heavier himself. His letter mentions that there are active M.I.T. clubs in both Buenos Aires and Montevideo and that the joint meetings of these clubs are particularly good. As to his personal matters, Entwistle says that his children are in college in the States. Frederick is a sophomore at William and Mary, with the idea of completing his college course at M.I.T. His daughter, Caryl Phyllis, is a freshman at Middlebury College in Vermont.

The Midwinter Meeting of the M.I.T. Alumni Association was held at Walker on Saturday, February 5. The 1923 men attending, and their guests, filled up two tables to the number of approximately 20 persons. This Midwinter Meeting is becoming a larger attraction each year. — The Taunton, Mass., *Gazette* devoted its birthday greetings column on December 24 to Arthur R. Belyea as a Taunton man who has distinguished himself elsewhere. Belyea has been on the technical staff of the Consolidated Gas Company of New York since 1925. He was married to Florence C. Westgate in Taunton in 1927. They are the parents of two daughters and make their home in Norwalk, Conn.

Two members of the Class have been named directors of banking institutions. In December, Irwin G. Schoeffel was elected a director of the Massena Banking and Trust Company of Massena, N.Y. He is works manager of the reduction division of the Aluminum Company of America. In January, Albert S. Redway was named to the board of the First National Bank and Trust Company of New Haven. Redway is executive vice-president and general manager of the Geometric Tool Company and a director of the Greenfield Tap and Die Corporation and of the Acme Wire Company. — HORATIO L. BOND, *Secretary*, National Fire Protection Association, 60 Batterymarch Street, Boston 10, Mass. HOWARD F. RUSSELL, *Assistant Secretary*, Improved Risk Mutuals, 60 John Street, New York 7, N.Y.

• 1924 •

Russ Ambach reports that registrations for the June reunion are coming in at the rate of four or five a day, and that the capacity of East Bay Lodge will be taxed well before the reunion opens on June 8. At this writing (mid-February) he has 75 applications. Names are omitted here because they will be published in Chick Kane's next class letter, when a more up-to-the-minute list will be available.

The class fund is also growing rapidly under the able direction of Cy Duevel and Ray Lehrer, and Chick reports that more than 300 biographies are in hand, with more arriving each day. They make very interesting reading, Chick says.

A release from Nutley, N.J., indicates that Paul Cardinal was appointed vice-president of Hoffmann-LaRoche in charge of the bulk vitamin division. He had previously been head of the hospital sales department, and later was codirector of the company's staff of medical detail men

and head of the bulk vitamin division.

From the *Brockton Times and Enterprise* we learn that A. D. Matarese, Vice-president of the Brockton Gas Light Company, has been elected to the board of directors and appointed general manager. Boston papers have announced the transfer of George Neitlich from the Roxbury District to the Everett-Chelsea District of the Metropolitan Life Insurance Company, and the fact that George is chaplain of Noodle Island Lodge, Ancient Free and Accepted Masons, a past director of the Boston Life Underwriters' Association, and New England regional director of the American Society of Chartered Life Underwriters.

Another transfer announced in the insurance field is that of Frank H. Plaisted, former general agent for Aetna Life Insurance Company at St. Louis, who has moved to a similar post at Portland, Ore. — John Cegan, telephone engineer at Providence, has been in Germany since the fall of 1947 as a member of the Bipartite Communications Group at Karlsruhe. Mrs. Cegan and their four daughters are with him, and expect to return to their home in Providence this summer. He has run into Lieutenant Colonel Bill Sturdy several times over there. — Ed Dunlaevy's election as vice-president of Phelps-Dodge Copper Products Corporation has been announced in New York papers. He had held executive posts in the sales department of the company for a number of years. — Philadelphia papers report the marriage of Kenneth B. Walton to Mrs. Doris Hofheimer Auerbach at Plainfield, N.J.

Our regional finance committee under the direction of Nat Schooler and Bill Correale are beginning to put the heat on class members in this area for their donation to our 25th anniversary gift to the Institute. We are still running considerably behind our quota, and of the \$15,000 which we have set out to get, \$13,000 still must be obtained. It is up to the New York group to set the pace and as yet that pace is not what it should be. So won't each and everyone of you stop procrastinating and make your decision regardless of the amounts so that your reunion committee can make a fair estimate of the work ahead of us, as we must not fail to reach our \$100,000 objective?

Your Assistant Secretary sees B. A. Cushman at frequent intervals and, believe it or not, we ushered together at the Darien Presbyterian Church not long ago. Mal MacNaught has a new job as publisher of the annual spring news edition of *M.I.T. in New York*. Jack Hennessey's company, Syska and Hennessey, are the consultants for the United Nations Project on the East River here in New York. Several of our classmates, including Paul Cardinal, sat in on a meeting of the \$20,000,000 fund-raising campaign. Remember our meeting at East Bay Lodge in June. See you there. — FRANCIS A. BARRETT, *General Secretary*, 234 Washington Street, Providence, R.I. WILLIAM W. QUARLES, *Assistant Secretary*, 330 West 42d Street, New York 18, N.Y.

• 1926 •

William Morris is credited with the observation that "blessed is the man who

finds joy in his work." According to one of the New York *Telegraph's* columnists, Russell Damon fits the Morris plan to a nicety. The columnist located "The Crossroads of Sport" at 15 East 54th Street and told his readers all about Damon and his partner in that enterprise and certainly made an interesting story of it. Damon is associated with one of his neighbors from Cranford, N.J., in catering to the elite of the trade. Their unique shop specializes "in decorative doo-dads, with a sporty twist . . ." and offers a "curious assortment of knick-knacks ranging from whiskey muddlers and key rings, featuring dice, trout flies and a compass (all encased in lucite) . . . to an oil painting of a moose drinking from a mountain stream."

The Secretary's mail has been brightened by letters from several classmates, among them Dick Plummer of E. R. Squibb and Sons de Mexico, Bean Lambert of Eccleston, Md., and Paul Jewell of Princess Anne, Md. The latter reports: "My job title is chairman of the division of mechanical industries, commercial industries, and plant engineer, Maryland State College. My duties are far afield. . . . Except for five years since taking my first degree at the Institute I have been engaged in a very stimulating if not too well paid area of employment, trying to bring some semblance of scientific and technical introductions and thinking in an area loaded with bootstrap philosophy and Seventeenth Century modes of action and thinking. During the war years I worked as a research and development electrochemical engineer. We licked every problem assigned to us (thanks to Dr. Goodwin's thorough teachings)."

Albert Entwistle of Louisville has been elected a director of the Mengel Company and vice-president in charge of its plywood division. This is his 14th year with the company. — Another who has advanced is William Gee, now a vice-president of the Texaco Development Corporation in New York. — Since leaving the North American Philips Company in Lewiston, Maine, Winslow Russell has become assistant chief engineer for Pabst Brewing Company in Milwaukee. — The Secretary was pleased to see Edgar Doolittle, who stopped by the office on a recent trip to Cambridge. He is liaison engineer for Fairchild Camera and Instrument Corporation. — Samuel Bloom has left New York to become technical director of the Baltimore Paint and Color Works. — JAMES R. KILLIAN, JR., *General Secretary*, Room 3-208, M.I.T., Cambridge 39, Mass.

• 1927 •

Since J. S. Harris is away on a business trip which will take him to the West Coast, I will try to give you all the information available at the present time. Colonel E. G. Cowen, C.A.C., is now located in Linz, Austria, and may be reached at Headquarters 7831 L.U.A.A.C., A.P.O. 174, in care of Postmaster, New York, N.Y. His present duty is that of commanding officer of the Fourth Constabulary Regiment. — Apparently, Glenn D. Jackson, Jr., has found that house we mentioned in the February class notes. His new address is 54 Lenox Road, Summit, N.J. — David R. Knox is now located at

10474 Lincoln Drive, Huntington Woods, Mich.

One of our New York papers carried an article entitled, "Oil Firm Shifts Several Officials." "H. W. Fisher, director and general manager of East Coast refineries, has been appointed deputy co-ordinator of refining activities for Standard Oil Co. (New Jersey), effective February 1st." — Carl R. Sydenstricker is associated with Westinghouse Electric Corporation, 306 Fourth Avenue, Post Office Box 1017, Pittsburgh 30, Pa. — Here is a new address for Raymond B. Block: 1933 North Main Street, Dayton 5, Ohio. — Frances Brohan, Secretary to JOSEPH S. HARRIS, *General Secretary*, Shell Oil Company, Inc., 50 West 50th Street, New York 20, N.Y.

• 1935 •

"Every time I get The Review, the first thing I turn to is the class news. But where is 1935?" That, my friends, is a quotation from the one letter I have to work with this month. One letter is more than usual. That answers the question: "Where is 1935?" Fred Kraus reports seeing several classmates at the annual meeting of the American Institute of Chemical Engineers. Ed Gelus of the Shell Oil Company, Houston, delivered a paper. Rod Whitney of the Institute of Paper Chemistry spoke and received a medal. Hank Ogorzaly of Esso, Bayway, N.J., and Randy Antonsen of Cabot Carbon Black were at the meeting. Hank is chairman of a committee concerned with the speaker's program for the Summit, N.J., Association of Scientists in his home town. Willard Bixby, head of development for Goodrich Chemical, was there, too. Fred reports seeing Ed Kass'37 and Al Frank now and then. Ed is a sanitary engineer and served as typhus control officer in Tokyo during part of his stint in the Army. Al is an independent consultant on sales and industrial engineering. Fred works for the Lummus Company, oil refinery engineers and constructors, has three youngsters and lives at 335 Pelhamdale Avenue, Pelham, N.Y.

A run-through of recent change-of-address notices and the Institute catalog show that at least four of our classmates are professors at the Institute: Walt Stockmayer, Chemistry; Bill Buechner, Physics; Howard Staley, Building Construction; and Bill Leary, Mechanical Engineering. The good news has been received that early in February, Wil Grosser was able to return to his position with Socony Vacuum Oil Company in Lower Manhattan (incorrectly reported as the Standard Oil Company in the February issue) after having spent several months in the hospital recuperating from poliomyelitis. "Where is 1935?" — J. BARTON CHAPMAN, *General Secretary*, 7 Lalley Boulevard, Fairfield, Conn.

• 1940 •

Richard T. Orth, who earned an M.S. in Business and Engineering Administration with our Class on the Alfred P. Sloan Fellowship, has been appointed general manager of the RCA tube department. Formerly merchandise manager of the

RCA tube department, Mr. Orth in his new capacity will co-ordinate and direct the activities of all tube department facilities, including plants in Harrison, N.J.; Camden, N.J.; Lancaster, Pa.; Indianapolis, Ind.; and Marion, Ind. Mr. Orth, whose latest appointment climaxes a steady rise in the RCA organization, joined the company in 1930, after receiving his B.S. in electrical engineering from Purdue University. From 1933 to 1938 he headed design groups on cathode-ray and receiving tubes. In the latter year, his special ability received the recognition of the Alfred P. Sloan Fellowship Award, and he took a year's leave of absence to attend the Institute. When the United States entered the War, Mr. Orth was given the assignment of speeding all the company's plant facilities to war production. Later, he assumed supervision of war contract service activity in all RCA Victor plants.

For his important investigation in the field of chemistry, a former class member, Conrad Schuerch, Jr., has been awarded the Harold Hibbert Memorial Fellowship at McGill University. Established through a \$100,000 bequest from the late Ernest Hibbert of Toronto, the award in the post-graduate field at McGill was given to Dr. Schuerch for his research into the structure of lignin in the school's department of chemistry since his graduation with a Ph.D. in 1947 from the Institute.

From your Secretary, and on behalf of the Class, many thanks to John L. Danforth for serving so faithfully as our representative on the Alumni Council in the past and for allowing us to present his name again for re-election for another five-year term. — H. GARRETT WRIGHT, *General Secretary*, in care of Garrett Construction Company, Main Post Office Box 629, Springfield, Mo. THOMAS F. CREAMER, *Assistant Secretary*, 6 Berkley Road, Scarsdale, N.Y.

• 1941 •

Since leaving school, Fred Came worked as an industrial engineer with the Procter and Gamble Company. In 1944 he went to Raytheon Manufacturing Company as head industrial engineer and in 1945 to Loyd Products as production engineer. Fred is married to Hazel Ward and has one boy. John England spent most of the war years in various technical assignments with the United States Army Air Forces, at Wright Field and then with the 8th Army Air Force in England. He is a bachelor the last we heard. Sam Solar served as a chemist in a small firm in Boston after graduation, then went back to Technology as a research assistant. He was married and joined the Celanese Corporation of America in 1943, then the Navy in 1944 and was discharged as a lieutenant (j.g.) after aircraft carrier service. He is now working in the fundamental research laboratories of Cluett, Peabody in Troy, N.Y. Ed Beaupre worked for Michigan Alkali Company for a year prior to entry into the Ordnance Department where he served until 1946. He was discharged as a major. He set up his own construction company and built numerous dwellings in the Keene, N.H., area. He is married and has four children. Arthur Gingrande went directly into the service, Signal Corps,

and did considerable liaison in radar research. He emerged as a captain in 1946 and joined Hytron Radio and Electronic Corporation, Newburyport, Mass. He is married and has one child. Charles Viola worked his first three years after graduation as a chemist at the Lynn Gas and Electric Company, then spent a year and a half in the Infantry. He joined the Deecy Products Company and is engaged in the manufacture of organic plasticizing compounds for the plastics industry. He is married and has one child. John Macleod, Jr., served a year as a civilian in the Canal Zone then four years in the Army starting at Indiantown Gap, to New Guinea, Leyte, Luzon, and Japan. John then joined the Ohio Aviation Board. Bob Butman, when we heard last, was with the Naval Research Laboratory in Boston, having served through the War with the Navy as a civilian chasing electrons. He is married and has one child. Kirke Marsh was in the Army Air Forces during the War and spent his time chasing between Florida and Europe. Kirke joined the Airadio Company in Stamford upon release from the service. Gardner Ketchum spent the entire time since 1941 at Technology moving up the ladder of professional fame. Don Howard spent the war years at Panama, Wright Field, and Guam, then joined Bemis Associates of Canada, Ltd. Kirk Miller joined Moldcraft, Inc., in Baltimore upon release from the Navy where he wore two stripes. — STANLEY BACKER, *General Secretary*, 101 Providence Road, Primos, Pa. JOHAN M. ANDERSEN, *Assistant Secretary*, Saddle Hill Farm, Hopkinton, Mass.

• 1943 •

Congratulations and all good wishes are in order for Art and Charlotte Vershbow on the birth of their daughter, Ann Rebecca. She was born on the 22d of January. The Vershbows live in Cambridge, Mass., at 128 Oxford Street. — John M. Fiore and the former Mary T. Fallon were married on January 29 at the St. Catharines Roman Catholic Church in Elizabeth, N.J. Mary's home is also in Elizabeth; she graduated from the College of St. Elizabeth in Convent, N.J. On the same day, but in Boston at the St. Ann's Church, Richard E. Henning and Jean B. German also were married. The bride is a graduate of Wellesley, class of 1948. Before her marriage, she was with the National Broadcasting Company in New York. Dick, a lieutenant in the regular Navy, is pursuing a graduate course at Technology in Naval Architecture and Marine Engineering.

We have heard that Elizabeth Mills Uptegrove and Warren E. Mathews are engaged. Elizabeth, who is a graduate from Bennington College, has recently returned from Hawaii where she was a member of the Kenawaena School. Warren graduated from Ohio Wesleyan before taking a master's degree in Electrical Engineering at M.I.T. He is currently with the Bell Telephone Laboratories at Murray Hill, N.J. Tom Dyer will be married later this spring to Hilda Worrell, who lives in Medford, Mass. Hilda is a graduate from the Garland School in Boston. Robert I. Mason and Helen Chaffin also are engaged. Helen's home is in Brookline, Mass.

The Rhode Island School of Design is her alma mater. From College Point, N.Y., we have word that Barbara B. Kraft and Norman J. Gordon are engaged. Like Warren Mathews, Norman did his undergraduate work at another college, Cornell, and later came to Technology for a master's degree. His bride graduated from Hunter College, but took a graduate course at Cornell. At present, Norman is the senior planner with the Providence, R.I., City Plan Commission.

Larry Stewart who completed his work at Harvard Business School, is now in St. Louis, Mo. Alexander G. Smith has received a professorship at the University of Florida, and Whitney Newton is at the manufacturing department of the Stanolind Oil and Gas Company in Tulsa, Okla. John Hummer has also recently acquired the title of professor. He is in the electrical department at Rhode Island State College. We have heard that Charles M. Clapp is with the Army in Alaska.

The most interesting story of the month is about Milton Borden. He and Homer Skinner '42, have decided to see the world the hard way. They bought a 35-foot sloop, the Atlanta, in which they plan to sail wherever they may get the urge to go. After resting for several days in Bermuda these hardy seafarers set sail for the Windward Islands in the West Indies. — CLINTON C. KEMP, *General Secretary*, 29 Verlynn Avenue, Hamilton, Ohio.

• 1944 (2-44) •

Here is another reminder to let you know that our 5th reunion is to take place in the Campus Room of the Graduate House. Plans for the affair are underway and if any of you have any suggestions, we would appreciate hearing from you. Incidentally, there are still several of you who have not changed your class affiliation back to the Class of 2-44. This can be done, if you wish, by merely dropping a short note to the Alumni Office stating that you would like to be connected with your original class.

Lamar Field, Ph.D., Chemistry, has joined the faculty of Vanderbilt University and is now an instructor there in chemistry. Warren Bishop is engaged to Diane Holt of Groton, Mass. Funeral services were held last January for Alexander Kann, Jr., who was killed in action over England on September 14, 1944, while serving with a photo reconnaissance group. He was a first lieutenant and entered the service in 1942. The burial was in the Green-Wood Cemetery at Brooklyn, N.Y. James Leader '43 is to be married to Jeanne Budde of Seattle, Wash., next July. Latest change of address cards show: Bill Engelmann in Blawnox, Pa.; Bob Estes in San Diego, Calif.; Marty King in Paterson, N.J.; Bob Kratz at Howell, N.J.; Bob Kulda, Inglewood, Calif.; Roger Patterson, Rochester, N.Y.; Don Phillips, Evanston, Ill.; Ernest Schoenwald, East Cleveland, Ohio. — WILLIAM B. SCOTT, *General Secretary*, Harvard Business School, Mellon C-41, Soldiers Field, Boston 63, Mass.

• 1945 (6-45) •

Jay Wright Forrester, associate director of the Servomechanisms Laboratory at

the Institute, has received one of two honorable mentions in the selection of the outstanding young electrical engineer of 1948 by the jury of award of Eta Kappa Nu, national honor society of electrical engineers. For details of this award see page 338. His present work is on an analogue simulation system which permits test pilots to get the realistic feel of flight controls and instruments. The group of 200 persons which he now heads is working on a new electronic digital computer technique to solve aircraft analyzer simulator problems.

Recent among the marriages is that of Dr. H. Carlton Howard and Sally Barclay. Carl graduated from the University of Pennsylvania medical school and he and his wife are living in Baltimore. Robert E. Wilson and Nina Fess were married in Stratford, Conn. Bud is an aeronautical engineer with Chance Vought Aircraft. Julian Gammon was married to Marion Morell in Pittsburgh, where they now live. Keith Whitmore, who received his Ph.D. from Technology in 1945, wed Mildred Veith in Rochester, N.Y. They are living in Webster, N.Y. — The following engagements have been announced: Tom McNamara to Louise Downey, in Dorchester; Dr. Robert S. Irvin to Barbara King of Manahawkin, N.J.; and David Mintzer to Justine Klein of New York. Mintzer has been a member of the Physics Department at the Institute since 1946. — DAVID P. FLOOD, *General Secretary*, 57 Beech Street, Framingham, Mass.

• 1946 (2-46) •

Announcement has just been received of the marriage of Ned Spencer and Irma M. Byck of Miami Beach on the first of February. A card accompanying the announcement advises that the couple will be at home at 307 Gardiners Avenue, Levittown, Long Island. Two other weddings that have taken place more recently are those of Edwin West and Mary C. Rowse of Lexington on January 29 and Ensign James Hawthorne and Patricia Cutler of Milwaukee, Wis., on February 19. In the engagement column we have word of that of Cadet Hillman Dickinson and Nancy Cameron of Pittsburgh, Pa. Hillman is scheduled to be graduated from the Military Academy in early June at which time (June 7) the wedding will take place.

A card from Lew Mann in New York tells us that he is at Columbia working for his doctor's degree in organic chemistry and passes the news to us that Mr. and Mrs. Sheung S. Chin had a baby daughter, Beverly, in December. Roy Klein writes from Dallas, Texas, where he's been working on the construction of petroleum processing plants for Process Engineers, Inc., that he and his wife have moved into their new home at 4230 Somerville Avenue. Also from down Texas way, in Mineral Wells, Don Burke sends along a good bit of news about himself and some classmates. Don is with the Texas branch of the M.K.M. Knitting Mills making nylon hose, which goes to show how far a Course XVI man can go astray when he goes astray. Other news from Don tells us that Giff Stanton is training in the New York area with Cities Service, Bob Striker is plug-

ging on technical developments for the American Broadcasting Company and Bert Jacques is back at the Institute doing research after having a fling at selling motorcycles. Thanks for the fine letter, Don.

Perhaps some classmates, meteorologists particularly, have read of the recent attempts by entrepreneurs to establish weather forecasting on a specialized basis as a commercially successful business. One such venture hereabouts is Weather Advisors, Inc., of which classmate Marion Hogan is vice-president and forecaster in charge of weather. She was graduated with a master's degree after attending Emanuel College. — JAMES S. CRAIG, *General Secretary*, 387 Harvard Street, Cambridge 38, Mass.

• 1947 •

Last fall, Ed Dytko, who received his M.S. in Course XVI, was "allegedly" burning up a Nashua, N.H., street at 55 miles per hour when he was flagged down by a Nashua policeman. Ed questioned the calibration of the policeman's speedometer, and, in the trial which followed, he produced a map he had drawn and presented a seven-page report showing the distance his car would have traveled at 55 miles per hour and the speed and distance the police officer would have to travel, from a dead stop, to catch him. Unfortunately, the Nashua judge did not appreciate beauty of cold mathematical logic and soaked him \$9.70.

The first official news that your roving Secretary, Claude Brenner, has finally reached England appeared in the form of a letter to The Review office this month. Claude is now employed as an aerodynamicist with the de Havilland Aircraft Company, Ltd., and states that the time of his return to this country is still indefinite. Perhaps Claude will be able to get together with Jim Ulmer who is now attending the University of Cambridge under the terms of a Rotary Fellowship awarded to him by Rotary International, world-wide service organization. Jim's major field of

study at Cambridge will be international relations. — In answer to our plea for news some months ago, Ed Kane wrote a grand letter from Thorold, Ontario, where he is now employed by the Ontario Paper Company, Ltd. Ed recently became engaged to Jackie Roth of West Hartford, Conn., and he is still serving the Institute as the newly elected Secretary-Treasurer of the Niagara Falls M.I.T. Club. George Katz, who we saw last on Alumni Day in 1948, attended Ed's engagement party and passed on the news that he has been made the merchandising manager of a new Sears Roebuck and Company store at Norwich, Conn.

Cupid's arrows have really been taking a heavy toll of '47. Walter Turner is engaged to Dorothy Ullman of North Arlington, N.J. Hrand Saxenian plans to wed Lucy Asadourian of Lowell, now attending Radcliffe. Darragh Nagle, who is still here attending graduate school, recently became engaged to Avery Leemings of Buffalo, N.Y. John Bartelt will marry Mary Cunningham of Philadelphia sometime in March and Jim Kane is engaged to Marian Nunn of Seattle, Wash., who is a senior at Wellesley. Other couples who are planning marriage in the near future are Al Ward and Margaret Ann Wood of Roxbury; David Taylor and Jeanne Dell of Ardmore, Pa.; Donald Guy and Kathleen Clarken of Los Angeles, Calif.; Bob Carpenter and Signe Katherine Brock of Wilmington, Del.; Albin Kazanowski and Mary Ann Kotuli of Haverhill, Mass.; and two old friends, Gene Gettel and Gertrude (Gale) Nightingale of Newton Highlands.

Tom Bell, now with the Industrial Tape Corporation of New Brunswick, N.J., was married in December to Frances E. Wiggins of Larchmont, N.Y. A few long overdue news clippings from Claude inform us that in August and September of last year Leo Quenneville married Adrienne Manseau of Winooski, Vt.; Bob Auriema wed Carol Jean Brodie of Pembroke, Mass.; Bob Crandall married Louise Taylor of Auburn, R.I.; and John Hammond married Barbara Gilman of Boston. A recent marriage is that of Ken Klingensmith to

Florence Balkan of Hartford, Conn., last month.

We spent last evening in a bull session about class affairs with your Class President, Norman Holland. Soon, we shall hope to enlist your support to bring our class files up to date, to prepare the class organization which will handle our class gift, and to begin planning for our 5th-year reunion. — JAMES L. PHILLIPS, *Acting Secretary*, Room 7-133, M.I.T., Cambridge 39, Mass.

• 1948 •

The engagements for this month include: Betty MacDonald of Stoneham, Mass., to Herman C. Carlson; Mary Ann Freng of Wellesley College and Rye, N.Y., to Richard S. White; Priscilla Chaplin Larner of Jackson College and Lexington, Mass., to William R. McEwen, Jr.; Nancy Knight of Wellesley College and Newark, N.J., to Charles K. Bloomer; Carolyn Smith of Marblehead to Richard A. Snow; Marie Reardon of Cambridge Junior College and Brighton to William Hart. — Members of the Class who have married recently include the following: Sheila Whitestone of Barnard College and New York City to Robert B. Cook; Patricia Sullivan of Milton, Mass., to Robert F. Rowe, the marriage taking place in Milton; Ellen Claire Byer of Vassar College and Columbus, Ohio, to Philip Friedlander; Mary Sue Bee of the Garland School and Cranbrook, Mich., to James B. Leahy; and Pauline Francis Carver of Swampscott, Mass., to Nichols Caldwell.

A note has arrived from Carl Accardo mentioning that he is employed as a junior scientist at the Evans Signal Laboratory in Belmar, N.J. His address is 907 13th Avenue in that city. — If members of the Class wish the present address of any of their classmates, they should drop a postal card to either the Assistant Secretary or to the Alumni Association office. — WILLIAM R. ZIMMERMAN, *General Secretary*, The Kurt Salmon Associates, Washington, D.C. RICHARD H. HARRIS, *Assistant Secretary*, 263 Harvard Street, Cambridge 39, Mass.

ALUMNI DAY, SATURDAY, JUNE 11, 1949

Your "once-a-year" chance to check up on the old gang and give the Institute a once-over.

HERE'S THE SCHEDULE:

FIRST — You register in the main Lobby under the great dome.

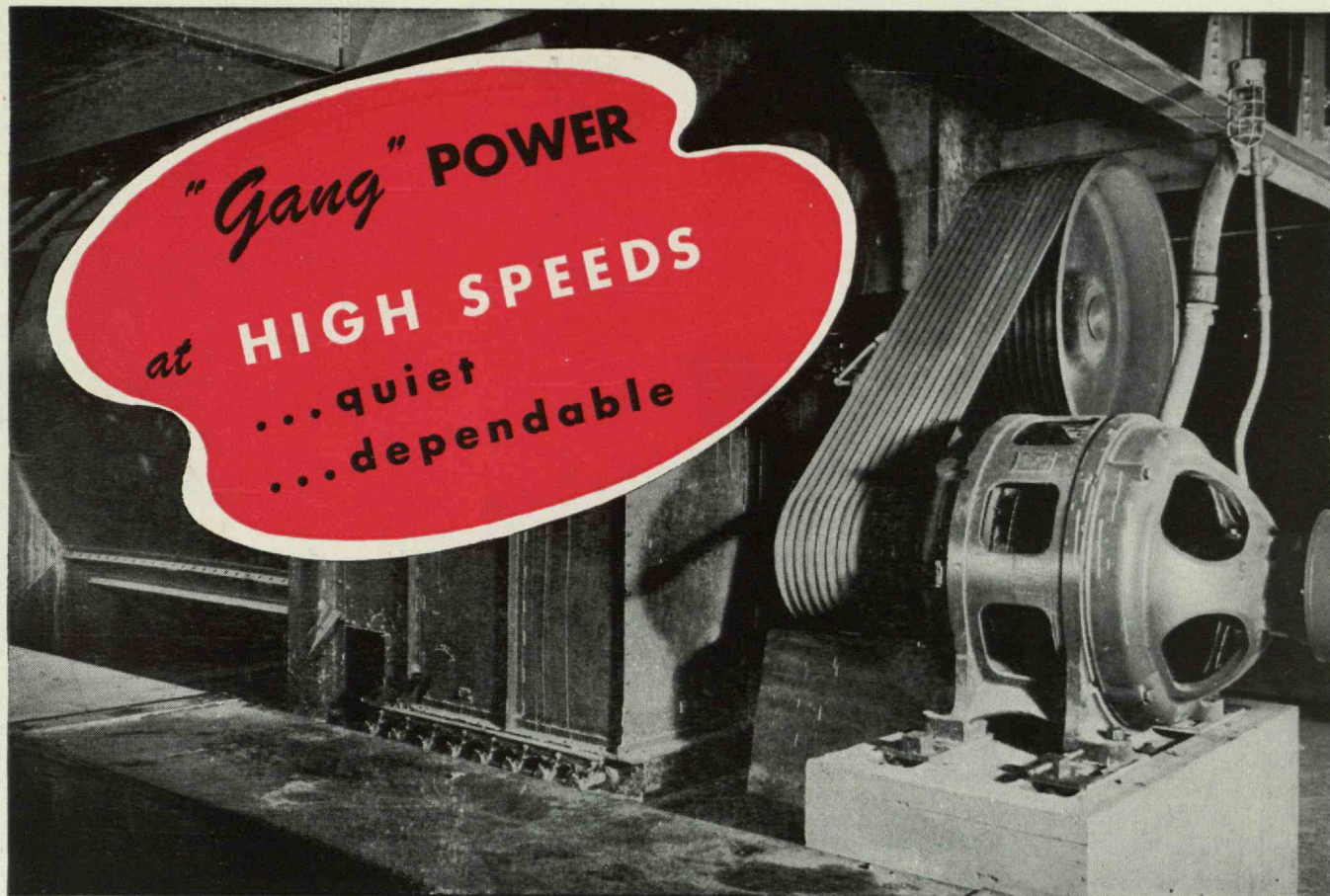
SECOND — You visit friends and staff, or you have a look at what's new around the Institute. There'll be demonstrations of projects such as the Synchrotron, the Supersonic Wind Tunnel, and the Gas Turbine Lab.

THIRD — You eat luncheon in duPont Court — a pleasant time with friends and family.

FOURTH — You meet Dr. and Mrs. Compton and President and Mrs. Killian at a tea in the new Senior House.

FIFTH — You gather with friends and classmates for informal reunions at the Statler.

SIXTH — The grand Alumni Banquet, Hotel Statler. Make sure you're there to pick up your stein in person.



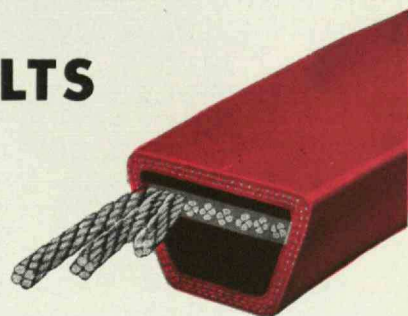
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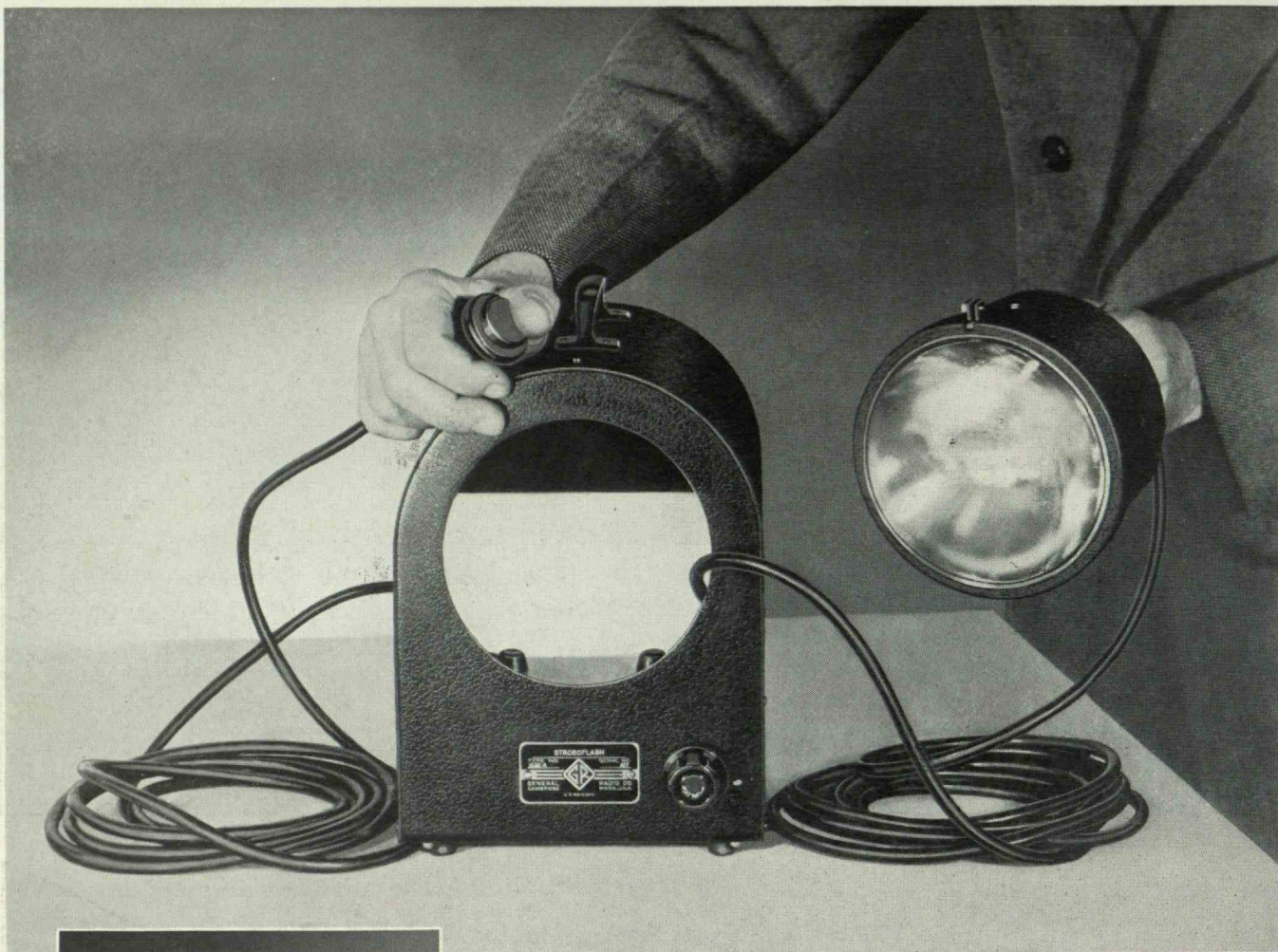
PASSAIC, NEW JERSEY

Thomas H. Boyd, '23

Wilder E. Perkins, '25

Charles P. McHugh, '26

Albert W. Beucker, '40



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